



ALLEN® 8803 UNITIZED TWIN
HAY RAKE
OWNER-OPERATOR/PARTS MANUAL

February 2016

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Carson City NV. 89721



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MACHINE IMPROVEMENTS

The Manufacturer reserves the right to make changes and improvements in the product at any time without notice. The Manufacturer shall not be obligated to incorporate such changes and improvements in products previously sold to any customer, nor shall the Manufacturer be obligated to replace previously sold products with customers incorporating such changes and improvements.

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8803 RAKE OPERATORS MANUAL

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SAFETY SYMBOLS

RECOGNIZE SAFETY INFORMATION

This is the safety symbol. When you see this, it means:

**ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!**

Follow recommended precautions and procedures:



UNDERSTAND SIGNAL WORDS

A signal word—**DANGER**, **WARNING**, or **CAUTION**—is used with the safety-alert symbol.

DANGER indicates imminently hazardous situations that, if not avoided, will result in serious injury, or death.

WARNING indicates potentially hazardous situations that, if not avoided, could result in serious injury, or death.

WARNING may also be used to alert against unsafe practices.

CAUTION indicates potentially hazardous situations that, if not avoided, could result in minor or moderate injury.

CAUTION may also be used to alert against unsafe practices.



DANGER



WARNING



CAUTION

FOLLOW SAFETY INSTRUCTIONS

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Remove missing or damaged safety signs. Contact for replacement parts.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine or disrepair may impair safety, or the machine function.



SAFETY PRECAUTIONS



ACCIDENTS CAN BE PREVENTED

Without the complete cooperation of the implement operator, no accident prevention program can be successful. The operator anticipating the results before an accident occurs and taking action to remedy the situation can prevent many accidents. No power driven equipment, whether it be for transportation or processing, whether it is used on the highway, in the field, or in the shop, can be safer than the person at the controls. If accidents are to be prevented, the operators who accept these responsibilities seriously will accomplish it. Elimination of careless acts and unsafe operation will be a help in getting your safety program off to a good start.

READ THE OPERATORS MANUAL — BE ALERT



CAUTION: BEFORE APPROACHING OR ENTERING ANY MECHANISM TO SERVICE, INSPECT, OR MAKE ADJUSTMENTS.

- A. LOWER UNIT TO THE GROUND
- B. SHUT THE TRACTOR OFF
- C. LOCK THE TRACTOR'S PARKING BRAKE
- D. REMOVE THE KEY

PREPARE FOR EMERGENCIES

Be prepared in the event of personal injury, fire, or environmental problem.

Keep handy a first aid kit, tools, equipment, supplies, fire extinguisher, and proper attire for handling chemicals associated with the machinery usage.

Keep handy the emergency numbers for doctors, ambulance service, hospital, fire department, and any other emergency personnel.



WARNING: AVOID HIGH-PRESSURE FLUIDS

Escaping fluid under pressure can penetrate the skin causing serious injury.

Shut off tractor before connecting or disconnecting hydraulic lines at tractor.

Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hand and body away from pinholes and components that may eject fluids under pressure. Use a piece of cardboard to search for leaks.

If ANY fluid is injected into the skin, it must be surgically removed immediately.



SAFETY PRECAUTIONS



1. Never connect hydraulic lines or operate any portion of the machine unless machine is hitched to tow vehicle or tractor.
2. Do not operate hydraulic systems when hydraulic leaks are present.
3. Never ride the machine during transport or movement.
4. Always observe local traffic laws when transporting unit on public roads.
5. Always operate machine in a careful, controlled manner.
6. Personnel operating and working with this machinery and in any related duties must be properly trained and free of conditions or substances that may impair safety or good judgment.
7. Personnel operating and working with this machinery must not wear loose, dangling or unbuttoned clothing which could tangle in machinery.
8. Do not exceed 90 RPM basket speed or serious rake damage may result.
9. Always stay clear of parts that can move and entangle, pinch or crush.
10. System hydraulic pressure is to be set at minimum possible for proper operation.
DO NOT EXCEED 2000 psi WORKING PRESSURE OR 2500 psi MAXIMUM PRESSURE.
11. Keep out of machine when in use.
12. Before starting machine, always check area around machine to verify that all personnel are clear.
13. Before transport or unhitching, always tie back hydraulic lines.
14. Before transport or unhitching, always tie back wires or cable with attached control panel, and place in the storage box.
15. Daily inspect fasteners for tightness (bolts, pins, etc.)
16. Always use proper procedures and equipment for handling, transporting, and storing any chemical associated with the usage of the machinery.
17. Before transport, always verify that no part of the machine can swing or slide out into the other traffic lanes, or drag on the roadway.
18. Before transport, inspect lug bolts and tire inflation.
19. Always park machine on flat ground for unhitching or storage. Before unhitching, place chocks in front and behind all transport wheels to prevent rolling when unhitched and parked.



SAFETY PRECAUTIONS



20. Stand clear of tongue, framework and tow vehicle or tractor when operating jack or working with hitch. Look around to be sure that if something slipped or accidentally moved that no harm would occur.
21. Always lock brakes on tractor or towing vehicle, place in parking gear, and shut off tractor or towing vehicle before working with rake jack or unhitching rake.
22. Do not attempt to use torch or welding arc around the machine when in the crop, in the field, or around other flammable items.
23. Always wear proper safety attire for each usage condition or service procedure.
24. READ AND OBSERVE SAFETY SIGNS.
25. ALWAYS USE A PROPER HITCH PIN WITH A SAFETY CLIP INSTALLED TO HITCH THE RAKE TO THE DRAW BAR OF THE TRACTOR OR TOWING VEHICLE.
26. THE EQUIPMENT DOES NOT HAVE BRAKES. DO NOT TOW AT SPEEDS OVER 20 MPH.
27. OPERATOR IS TO TURN ON FLASHING WARNING LIGHTS WHENEVER TRAVELING ON A HIGHWAY, EXCEPT WHERE SUCH USE IS PROHIBITED BY LAW.
28. MAXIMUM FIELD SPEED NOT TO EXCEED 7 MPH.



SAFETY SIGNS



CUSTOMER RESPONSIBILITY

Safety signs must be kept legible. Replace any safety sign that becomes illegible (unreadable) or is missing.

Safety signs are supplied separately from equipment parts. It is the responsibility of the customer to purchase and affix safety signs per the equipment manufacture's current recommendation, to any equipment part to be used during repair.

When ordering new equipment parts to be used during repair, always be sure to order any safety sign(s) to be affixed to that part.

How to apply safety signs with self-adhesive backs:

1. Wash surface clean using a degreasing soap and water solution to remove all oil, solvent, and dust.
2. Use a square and pencil to mark decal location.
3. Position decal and apply to equipment. Use a wet cloth or squeegee to remove air bubbles from each decal immediately after application.

DECALS and SAFETY SIGNS



Location: Front of rake basket



Location: Front of rake basket



Location: Vertical tongue frame, below rake control valve.



Location: LH & RH side of the tongue main frame, to the rear of the V.

DECALS and SAFETY SIGNS



Location: Facing outward on the framework above each wheel



Location: Facing outward on the framework above each wheel



Location: Facing outward on the framework above each wheel

MODEL 8803

Location: Outwardly facing, on each side of the main frame, behind the main frame members that "V" outwards from the tongue.

DESCRIPTION OF THE 8803 RAKE

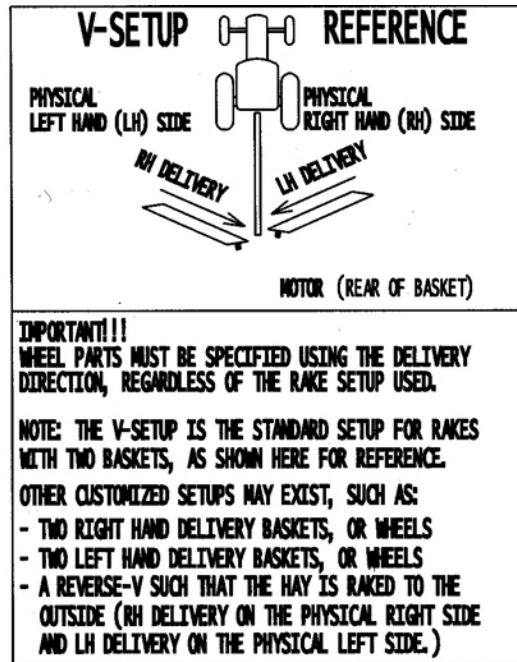
The 8803 Rake is a hydraulically driven rake used in many heavy and custom applications.

The unitized frame is extended outward to each side for raking hay and retracted for transport to and from the field.

Hydraulic motors, allowing constant basket speed even if the tractor ground speed changes, drive the left-hand delivery and right-hand delivery baskets.

Controls for the rake can be either manually operated levers or an electric control panel. The operator keeps the rake control console handy for easy access while in the tractor seat.

The following V-SETUP REFERENCE applies to the standard configuration of the ALLEN 8803 RAKE.



Obtaining Assistance:

We at Allen Farm Equipment appreciate your choice of this rake. If you need assistance, you can reach us at:

Allen Farm Equipment, LP
P.O. Box 21049
Carson City NV. 89721
Phone: (775) 246-4555 Fax: (775) 246-4555

SHIPPING, UNLOADING, SITE ASSEMBLY AND DELIVERY OF THE 8803 RAKE

The 8803 Rake is shipped in a partially assembled condition. Before hoisting any component from the truck or container, be sure that it is secured in a manner that will not allow accidental movement or falling.



CAUTION

BEFORE ATTEMPTING TO UNLOAD, ASSEMBLE, OR DELIVER THE HAY RAKE, READ THE SAFETY SECTION OF THIS MANUAL. BE ESPECIALLY AWARE OF THE FOLLOWING PRECAUTIONS:

- ⌋ Always wear proper safety attire for each usage condition or service procedure.
- ⌋ During unloading and assembly, always stand clear. Look around to be sure that if something slipped or accidentally moved that no harm would occur.
- ⌋ Stand clear of tongue, framework and tow vehicle or tractor when operating jack or working with hitch. Look around to be sure that if something slipped or accidentally moved that no harm would occur.
- ⌋ Before transport, inspect lugs bolts and tire inflation
- ⌋ Before transport, always verify that no part of the machine can swing or slide out into other traffic lanes or drag on the roadway.

Pictures and instructions can be found throughout this manual to assist in the required site assembly.

Refer to the transport instructions in the manual prior to delivery of the Cotton Cart to the customer or work site.

See the Delivery Checklist prior to delivery or operation of the rake. (Next Page)

**PRE-DELIVERY AND DELIVERY LIST
FOR THE DEALER, CUSTOMER, AND OPERATOR
8803 RAKE**

NOTE: Dealer, Customer, and Operator should review each item on this list together in order to know how each was accomplished.

1.



CAUTION

Review the Operator's Manual. Note especially the instruction for:

- ⌋ Safety
- ⌋ Unloading
- ⌋ Assembly
- ⌋ Operation
- ⌋ Transportation
- ⌋ Service and Maintenance
- ⌋ Emergency Procedures

2. Check all fasteners for tightness. Refer to the suggested tightening torque values for SAE Grade 5 bolts, below:

Size	Minimum Torque		Size	Minimum Torque	
	<u>Gr. 5 (Foot-Lbs)</u>	<u>Gr. 8 (Foot-Lbs)</u>		<u>Gr. 5 (Foot-Lbs)</u>	<u>Gr. 8 (Foot-Lbs)</u>
1/4	7	10	5/8	125	173
5/16	15	21	3/4	225	306
3/8	25	35	7/8	340	495
7/16	41	57	1	510	740
1/2	63	87			

3. **THIS EQUIPMENT DOES NOT HAVE BRAKES. DO NOT TOW AT SPEEDS OVER 20 MPH. OPERATOR IS TO TURN ON FLASHING WARNING LIGHTS WHENEVER TRAVELING ON A HIGHWAY, EXCEPT WHERE SUCH USE IS PROHIBITED BY LAW.**

4. Hydraulic oil must be:

- ⌋ Clean. Change filter prior to cart operation and at frequent intervals during raking season. Change oil per tractor recommendations. Dirty oil or a clogged filter will cause poor performance, as well as harm the pump and other components.
- ⌋ Full. Daily check level of hydraulic oil.
- ⌋ Properly Managed. Prevent spills during service procedures. Do not actuate cylinders with lines disconnected or loose.

**PRE-DELIVERY AND DELIVERY LIST
FOR THE DEALER, CUSTOMER, AND OPERATOR
8803 RAKE**

5. Inspect rake systems (cont'd):



CAUTION: BEFORE APPROACHING OR ENTERING ANY MECHANISM TO SERVICE, INSPECT, OR MAKE ADJUSTMENTS.

- A. LOWER UNIT TO THE GROUND
- B. SHUT THE TRACTOR OFF
- C. LOCK THE TRACTOR'S PARKING BRAKE
- D. REMOVE THE KEY

- A. With the hydraulic hoses **NOT** connected to the tractor, turn the rake disc by hand. All parts should move freely. Tines should clear the stripper bars by at least 1/2". If a stripper bar has become bent in shipment, then straighten using the rake hickey bar or pipe wrench.
- B. With the hydraulic hoses NOT connected to the tractor, review the hydraulic system for proper tightness of all fittings.
- C. With the tractor engine shut off, connect the hydraulic hoses to the tractor.
- D. Read and follow the instructions in the manual for "*Adjusting the ALLEN Rake Hydraulic System*" for further explanation regarding adjustments.
- E. Start with the rake flow control set at about 1-1/2". Slowly and carefully turn on the tractor hydraulics to begin operation. The rake baskets should be turning very slowly.
- F. With the tractor safely parked and while keeping clear of the rake, visually inspect for loose parts and hydraulic leaks. Should there be any problems, follow all safety procedures, especially the messages given with this step and remedy the problem.



WARNING: AVOID HIGH-PRESSURE FLUIDS

- 1. Escaping fluid under pressure can penetrate the skin causing serious injury.
- 2. Shut off tractor before connecting or disconnecting hydraulic lines at tractor.
- 3. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hand and body away from pinholes and components that may eject fluids under pressure. Use a piece of cardboard to search for leaks.
- 4. If ANY fluid is injected into the skin, a doctor familiar with this type of injury must surgically remove it immediately.



CAUTION

Never place or insert anything in basket or other moving parts during operation.

DO NOT EXCEED 2200 psi WORKING PRESSURE or 2500 psi MAXIMUM PRESSURE.
System hydraulic pressure is to be set at minimum possible for proper operation.

6. Tractor requirements: (14) gallons per minute continuous flow.

(PHOTOCOPY THIS PAGE)

**PRE-DELIVERY AND DELIVERY LIST
FOR THE DEALER, CUSTOMER, AND OPERATOR**

NOTE: Dealer, Customer, and Operator should review each item on this list together in order to know how each was accomplished.

7. Warranty Registration:

Customer must complete and send in the warranty registration card that is attached to the back of the manual. Warranty validation will not occur unless warranty registration card is returned to:

Allen Farm Equipment, LP
P.O. Box 21049
Carson City NV. 89721
Attn: Warranty Department

8. Record the serial number here for future reference.

Serial Number: _____

(PHOTOCOPY THIS PAGE)

Allen Farm Equipment welcomes any comments regarding the condition of the rake upon arrival at the dealership or farm.

Comments:

Signature: _____

SETUP AND DESCRIPTION OF CONTROLS 8803 RAKE



CAUTION

Read all SAFETY MESSAGES at the beginning of this manual before attempting any of the procedures described in this section.



NOTE

In order to set up your ALLEN rake, it may be necessary to utilize certain hydraulic functions.

If so, the rake will need a preliminary hydraulic setting. To achieve this preliminary setting, refer to the section of this manual, *“PRE DELIVERY AND DELIVERY LIST”*. Perform all the steps.

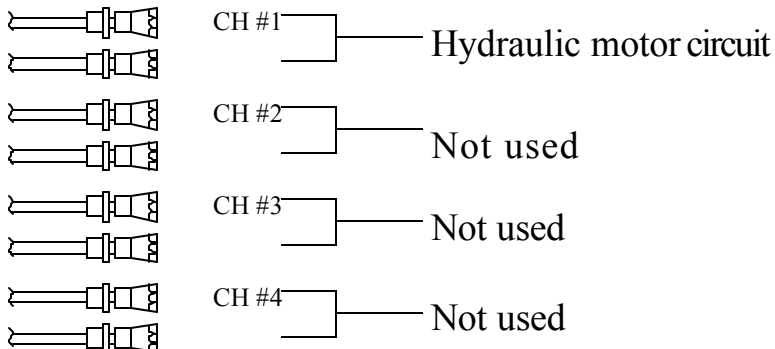
The hydraulic settings in the *“PRE DELIVERY AND DELIVERY LIST”* will be sufficient to operate the rake functions during the set-up of the rake. Follow all of the safety precautions.

BEFORE RAKING HAY:

To prevent damage to your rake, the rake hydraulic system must be adjusted according to the instructions in the following sections of this manual:

“UNDERSTANDING THE ALLEN HYDRAULIC SYSTEM”
“ADJUSTING THE ALLEN HYDRAULIC SYSTEM”

CONNECTIONS TO TRACTOR



JACK OPERATION 8803 RAKE

Read the following safety precautions, then sequentially follow the instructions given below. A pictorial reference is provided.



CAUTION

Stand clear of tongue, framework and tow vehicle or tractor when operating jack or working with hitch. Look around to be sure that if something slipped or accidentally moved that no harm would occur.

Always park machine on flat ground for unhitching or storage. Before unhitching, place chocks in front and behind all transport wheels to prevent rolling when unhitched and parked.

Always lock brakes on tractor or tow vehicle, place in parking gear and shut off tractor or vehicle before working with the rake jack or unhitching rake.

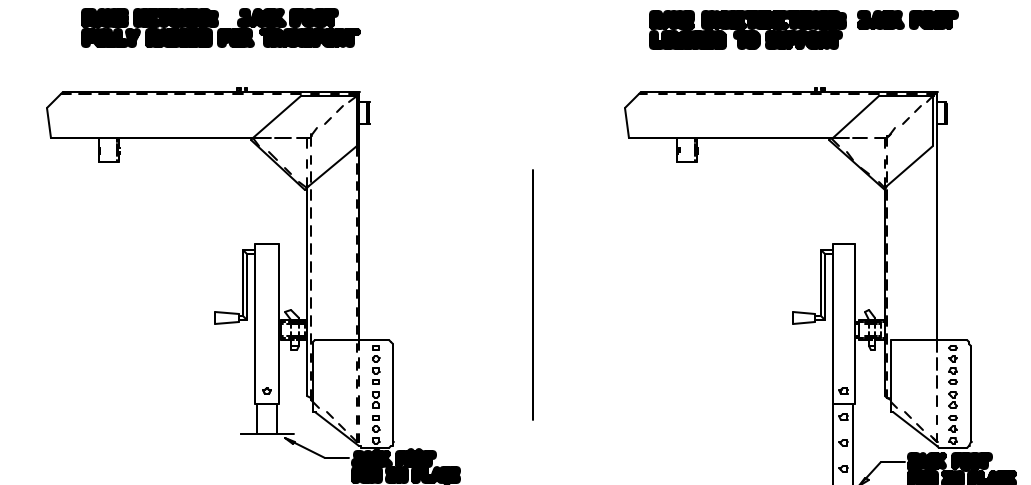
ALWAYS USE A PROPER HITCH PIN WITH A SAFETY CLIP INSTALLED TO HITCH THE RAKE TO THE DRAW BAR OF THE TRACTOR OR TOWING VEHICLE. (See figure, next page.)

HITCHING

Using the jack's crank handle, raise or lower the rake tongue to align the rake hitch with the draw-bar of the tractor or tow vehicle. Securely hitch rake to tractor using a proper hitch pin with a safety clip installed. Use the jack's crank handle to take the pressure off of the jack foot. Pull the jack foot pin and push the jack foot fully up inside the leg of the jack. Insert jack foot pin into the aligned holes in the leg of the jack and the raised foot. Use the jack's crank handle to fully retract the leg of the jack to the transport position.

UNHITCHING

Before unhitching the rake from the tractor or tow vehicle, pull the jack foot pin and lower the jack foot as far as possible to have aligned holes in the side of leg and foot of the jack. Insert the jack foot pin into the aligned holes. Using the rake's crank handle, raise the rake hitch off of the draw-bar of the tractor or tow vehicle. After chocking front and back of the rake wheels, unhitch the rake.



FRAME HEIGHT 8803 RAKE

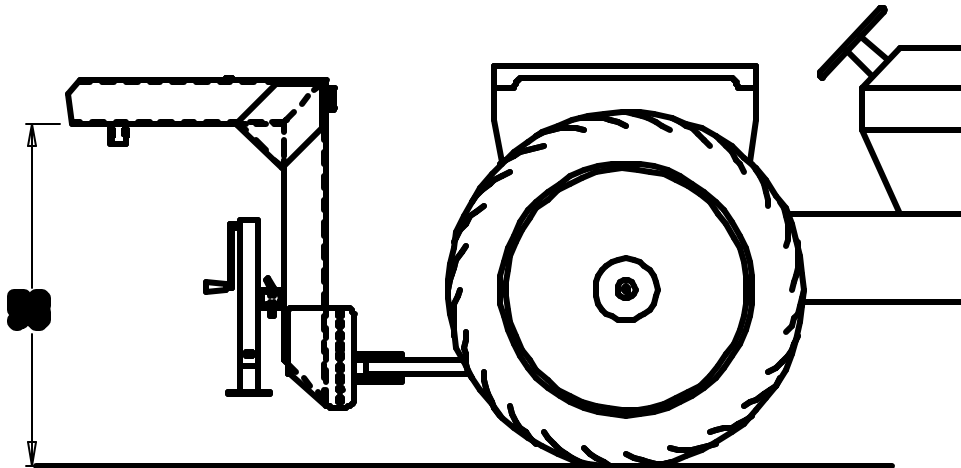


CAUTION

Stand clear of tongue, framework and tow vehicle or tractor when operating jack or working with hitch. Look around to be sure that if something slipped or accidentally moved that no harm would occur.

Always lock brakes on tractor or tow vehicle, place in parking gear and shut off tractor or vehicle before working with the rake jack or unhitching rake.

ALWAYS USE A PROPER HITCH PIN WITH A SAFETY CLIP INSTALLED TO HITCH THE RAKE TO THE DRAW BAR OF THE TRACTOR OR TOWING VEHICLE.



FRAME HEIGHT:

For proper and consistent raking, the top surface of the tubing frame should be initially set level with the ground. The same measurement (58") is to be accomplished at the tongue and at the wheels.

To change the frame height:

First, support the rake with the jack. See "*Jack Operation*" in this manual.

Secondly, reposition the hitch height using the bolt holes provided on the rake tongue. Torque hitch bolts properly. See chart in "*...Delivery List*".

The 58" frame height is the nominal setting to start from as a reference. This height will vary depending on tire pressure, wear of the tines, etc. Setting a level frame height can reduce the amount of basket readjustment required when changing from one raking position to another. (See "*Raking Positions*" in this manual.)

The frame height should be taken note of when:

- ⚡⚡ adjusting the overall rake to the individual raking preference.
- ⚡⚡ adjusting the rake baskets to the individual raking preference.
- ⚡⚡ changing to another raking tractor.

TRANSPORTATION 8803 RAKE



CAUTION

Read all safety instructions at the beginning of the manual. Especially regard the following:

ALWAYS USE A PROPER HITCH PIN WITH A SAFETY CLIP INSTALLED TO HITCH THE RAKE TO THE DRAW BAR OF THE TRACTOR OR TOWING VEHICLE.

THIS EQUIPMENT DOES NOT HAVE BRAKES. DO NOT TOW AT SPEEDS OVER 20 MPH.

OPERATOR IS TO TURN ON FLASHING WARNING LIGHTS WHENEVER TRAVELING ON A HIGHWAY, EXCEPT WHERE SUCH USE IS PROHIBITED BY LAW.

Never connect hydraulic lines or operate any portion of the machine unless machine is hitched to tow vehicle or tractor.

Never ride on the machine during transport or movement.

Always observe local traffic laws when transporting unit on public roads.

Personnel operating and working with this machinery and in any related duties must be properly trained and free of conditions or substances that may impair safety or good judgment.

Before transport or unhitching, always tie back hydraulic hoses.

Before transport or unhitching, always tie back wires or cable with attached control panel and place in the storage box.

Before transport, always verify that no part of the machine can swing or slide out into other traffic lanes or drag on the roadway.

Before transport, inspect lug bolts and tire inflation.

Always park machine on flat ground for unhitching or storage. Before unhitching, place chocks in front and behind all transport wheels to prevent rolling when unhitched and parked.

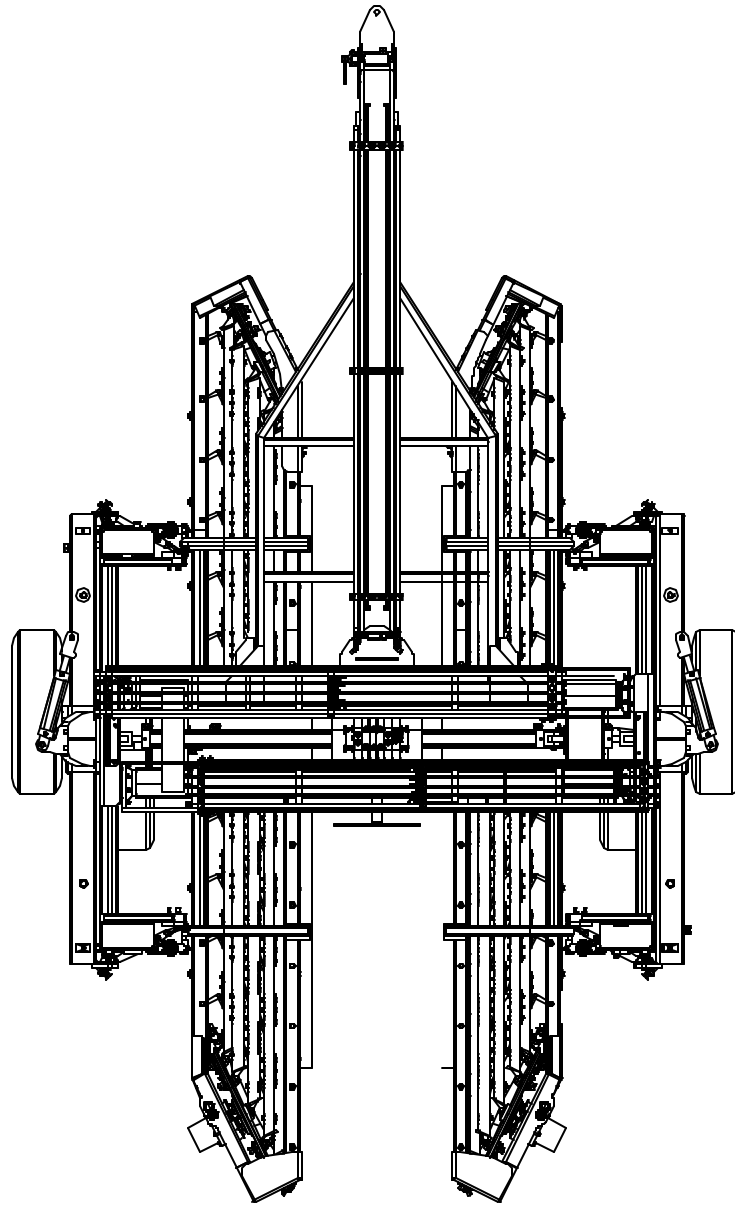
Stand clear of tongue, framework and tow vehicle or tractor when operating jack or working with hitch. Look around to be sure that of something slipped or accidentally moved that no harm would occur.

Always lock brakes on tractor or tow vehicle, place in parking gear and shut off tractor or vehicle before working with the rake jack or unhitching rake.

TRANSPORTING INSTRUCTIONS:

While following safety procedures, put the rake into the compact transport position, as shown on the next page. Drive slowly (20 mph or less). Drive carefully, always being aware of the rake's position in relation to traffic and roadside objects.

TRANSPORTATION
8803 RAKE



TOP VIEW

MOTOR REVERSAL CONTROLS: HYDRAULIC RAKING FUNCTION BASKET RAKE



CAUTION

Read all Safety Messages at the beginning of this manual before attempting any of the procedures described in this section.

Regard especially the following:



CAUTION

BEFORE APPROACHING OR ENTERING ANY MECHANISM TO SERVICE, INSPECT OR MAKE ADJUSTMENTS:

- A. LOWER UNIT TO THE GROUND.
- B. SHUT THE TRACTOR OFF.
- C. LOCK THE TRACTOR'S PARKING BRAKE.
- D. REMOVE THE KEY.



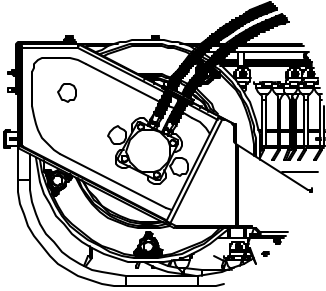
WARNING: AVOID HIGH-PRESSURE FLUIDS

1. Escaping fluid under pressure can penetrate the skin causing serious injury.
2. Shut off tractor before connecting or disconnecting hydraulic lines at tractor.
3. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hand and body away from pinholes and components that may eject fluids under pressure. Use a piece of cardboard to search for leaks.
4. If ANY fluid is injected into the skin, a doctor familiar with this type of injury must surgically remove it immediately.

MOTOR REVERSAL CONTROLS: HYDRAULIC RAKING FUNCTIONS BASKET RAKE



CAUTION: See safety messages on previous page.



Motor Reversal

Occasionally, the hydraulic hoses connecting the hydraulic motor on the basket will be installed backwards. This will result in the reverse rotation of the motor. When this occurs, reverse the hoses to the hydraulic motor. (See figure to the left)

Hydraulic Raking Functions

The rake comes equipped with a five function control box that hydraulically operates five raking and turning functions. The control box can be easily mounted to the towing vehicle for operation of the functions from the seat, see Fig. 11. To operate:

(The following instructions pertain to control box when mounted and operated from the seat.)

- 1) To lower the baskets into raking position, push the center switch downward.
- 2) To raise the baskets push the center switch upward.
- 3) To extend the left leg, push the left extend switch upward.
- 4) To retract the left leg, push the left extend switch downward.
- 5) To extend the right leg, push the right extend switch upward.
- 6) To retract the right leg, pull the right extend switch downward.
- 7) To adjust the left basket angle, push or pull, down or up on the left basket raise switch .
- 8) To adjust the right basket angle, push or pull, down or up on the right basket raise switch.



**MANUAL RAKING ADJUSTMENTS
BASKET ANGLE AND BASKET TILT
BASKET RAKE**



CAUTION

Read all Safety Messages at the beginning of this manual before attempting any of the procedures described in this section.

Regard especially the following:



CAUTION

**BEFORE APPROACHING OR ENTERING ANY MECHANISM
TO SERVICE, INSPECT OR MAKE ADJUSTMENTS:**

- A. LOWER UNIT TO THE GROUND.
- B. SHUT THE TRACTOR OFF.
- C. LOCK THE TRACTOR'S PARKING BRAKE.
- D. REMOVE THE KEY

Stay clear of the tines and framework.
Look around to be sure that if something slipped or accidentally
moved, no harm would occur.

BASKET ANGLE AND BASKET TILT BASKET RAKE



CAUTION: See safety messages on previous page.

NOTE: BEFORE MAKING ANY OF THE FOLLOWING ADJUSTMENTS, LOWER THE BASKETS AS ILLUSTRATED IN HYDRAULIC RAKING FUNCTIONS. THIS WILL PREVENT DAMAGE TO THE FRAME AND MAKE IT EASIER TO MAKE THE ADJUSTMENTS.

Basket Tilt: The rake also comes equipped with a screw adjustment bar to position the tilt of the basket in relation to the ground.

- 1) Loosen the locking device.
- 2) Turn the bar for desired basket tilt.
- 3) When the basket is perpendicular to the ground, a loose fluffy windrow is made.
- 4) When the basket is tilted forward to the ground a tight, more compact windrow is made.
- 5) Tighten the locking device.



TINE ADJUSTMENT BASKET RAKE



CAUTION

Read all Safety Messages at the beginning of this manual before attempting any of the procedures described in this section.

Regard especially the following:



CAUTION

BEFORE APPROACHING OR ENTERING ANY MECHANISM
TO SERVICE, INSPECT OR MAKE ADJUSTMENTS:

- A. LOWER UNIT TO THE GROUND.
- B. SHUT THE TRACTOR OFF.
- C. LOCK THE TRACTOR'S PARKING BRAKE.
- D. REMOVE THE KEY

Stay clear of the tines and framework.
Look around to be sure that if something slipped or accidentally
moved, no harm would occur.

PREPARING FOR TINE ADJUSTMENT

Following all safety instructions the following must be accomplished before the tines can be adjusted:

1. Rake hitched to tractor. See "*JACK OPERATION.*"
2. Frame height set level. See "*FRAME HEIGHT.*"
3. Rake hydraulics set for operation. See "*ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM*" or Rake hydraulic given a preliminary setting. See "*PRE DELIVERY AND DELIVERY LIST.*"
4. Rake frame and baskets positioned as actually intended for raking. See "*RAKING POSITIONS.*", "*HYDRAULIC RAKING FUNCTIONS.*"

TINE ADJUSTMENT BASKET RAKE



CAUTION: See safety messages on previous page before attempting any of these procedures.

TINE ADJUSTMENT

The basket adjustment has a ground adjustment screw to allow the lowering of the basket and the positioning of the tines in relation to the ground.

To adjust the tines for raking, follow the procedure, below:

1. Using the control console, lower the basket fully, until the lifting frame comes to rest on a mechanical stop.
2. Shut off tractor hydraulics. Shut off tractor engine. Lock the parking brake. Remove key.



CAUTION

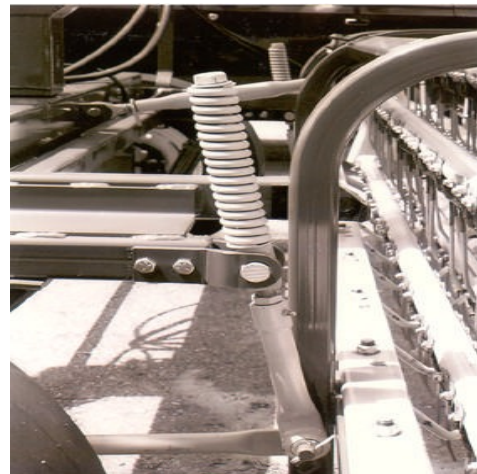
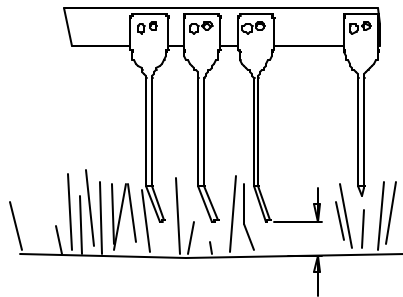
BEFORE APPROACHING OR ENTERING ANY MECHANISM TO SERVICE, INSPECT OR MAKE ADJUSTMENTS:

- A. LOWER UNIT TO THE GROUND.
- B. SHUT THE TRACTOR OFF.
- C. LOCK THE TRACTOR'S PARKING BRAKE.
- D. REMOVE THE KEY

Stay clear of the tines and framework.

Look around to be sure that if something slipped or accidentally moved, no harm would occur.

3. Raise and lower the tines by first loosening the jam nut, then turning the bolt head (Figure 16: Item 1, on top of spring). Re tighten jam nut. The distance between the tine and the ground should be set to ½ inch minimum. The tines at the delivery end of the basket may sometimes be set higher since the crop is already lifting. This helps reduce tine damage and motor damage from obstructions on the ground.



RAKING POSITIONS BASKET RAKE



CAUTION

Read all SAFETY MESSAGES at the beginning of this manual before attempting any of the procedures described in this section.

Regard especially the following:

BEFORE APPROACHING OR ENTERING ANY MECHANISM TO SERVICE, INSPECT, OR MAKE ADJUSTMENTS:

- A. LOWER UNIT TO THE GROUND.
 - B. SHUT THE TRACTOR OFF.
 - C. LOCK THE TRACTOR'S PARKING BRAKE.
 - D. REMOVE THE KEY.
-

STAND CLEAR

Look around to be sure that if something slipped or accidentally moved that no harm would occur.

Personnel operating and working with machinery must not wear loose, dangling or unbuttoned clothing that could tangle in machinery.

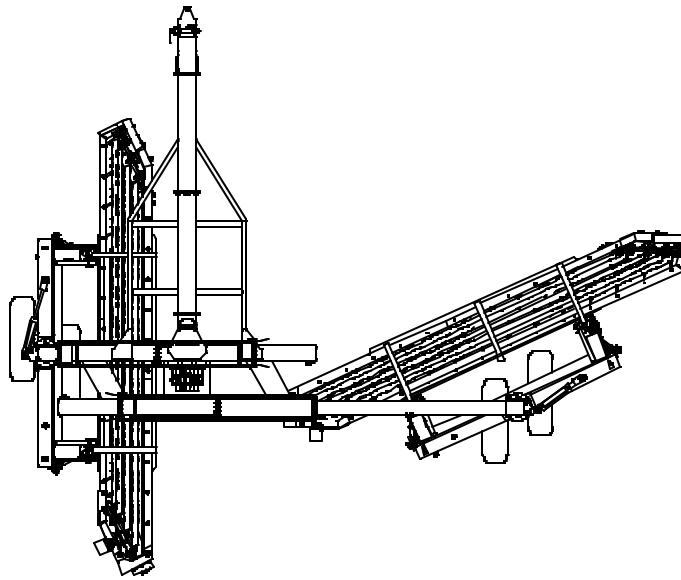
RAKING POSITIONS BASKET RAKE



CAUTION: See safety messages on previous page before attempting any of these procedures.

Turning a Windrow

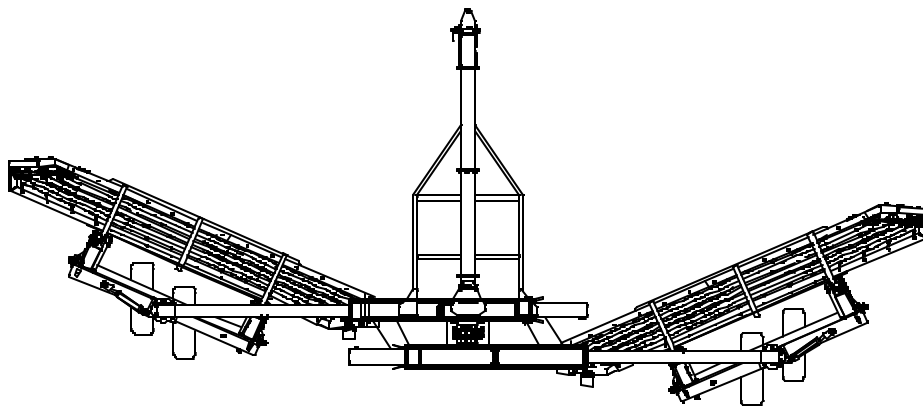
Note: By turning rake speed down with flow control and by positioning basket #1 at a slight angle in relation to basket #2, it will allow hay to be turned uniformly for drying purposes. See the figure below.



Turning Two Windrows In

Note:

- 1) Extend left and right leg until 4" travel remains on each side.
- 2) Position of basket #1 and #2 will then be as shown below.
- 3) And again, by turning rake speed down with flow control while baskets are in this position, it will allow hay to be turned uniformly for drying purposes.



RAKING POSITIONS BASKET RAKE

The 8803 Rake is equipped with a variety of adjustments to give the operator the flexibility to handle light or heavy cuttings, to make fluffy or tight windrows, to turn two windrows, to combine several windrows, etc.



CAUTION

Read all SAFETY MESSAGES at the beginning of this manual before attempting any of the procedures described in this section.

Regard especially the following:

BEFORE APPROACHING OR ENTERING ANY MECHANISM TO SERVICE, INSPECT, OR MAKE ADJUSTMENTS:

- A. LOWER UNIT TO THE GROUND.
 - B. SHUT THE TRACTOR OFF.
 - C. LOCK THE TRACTOR'S PARKING BRAKE.
 - D. REMOVE THE KEY.
-

STAND CLEAR

Look around to be sure that if something slipped or accidentally moved that no harm would occur.

Personnel operating and working with machinery must not wear loose, dangling or unbuttoned clothing that could tangle in machinery.

RAKING POSITIONS BASKET RAKE



CAUTION: See safety messages on previous page before attempting any of these procedures.

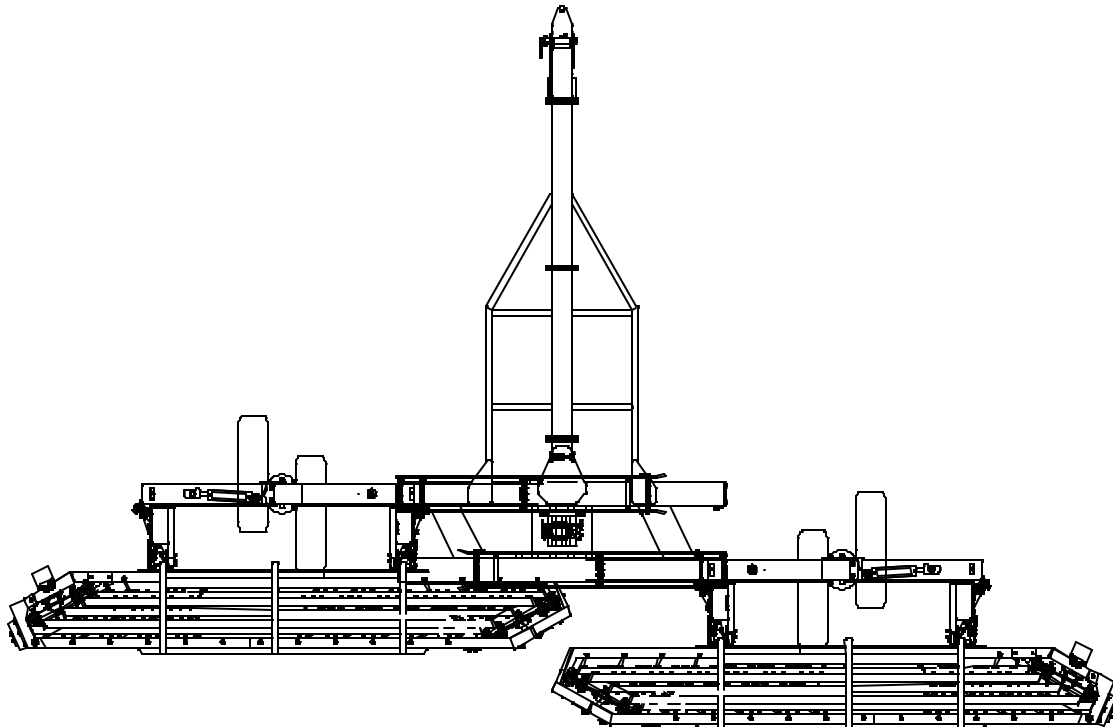
Tedding a Windrow

Your 8803 also has built in versatility like no other.

To obtain the tedding position open the frame, rotate baskets behind the wheels.

NOTE: The hydraulic cylinders must be removed to obtain this operation. (A stiff arm installed in its place. The stiff arm is not provided with the unit.)

Move at normal ground speed with baskets operating. The crop will be lifted and moved over about 18" on to dry ground.



RAKING POSITIONS BASKET RAKE

The 8803 Rake is equipped with a variety of adjustments to give the operator the flexibility to handle light or heavy cuttings, to make fluffy or tight windrows, to turn two windrows, to combine several windrows, etc.



CAUTION

Read all SAFETY MESSAGES at the beginning of this manual before attempting any of the procedures described in this section.

Regard especially the following:

BEFORE APPROACHING OR ENTERING ANY MECHANISM TO SERVICE,
INSPECT, OR MAKE ADJUSTMENTS:

- A. LOWER UNIT TO THE GROUND.
- B. SHUT THE TRACTOR OFF.
- C. LOCK THE TRACTOR'S PARKING BRAKE.
- D. REMOVE THE KEY.

STAND CLEAR

Look around to be sure that if something slipped or accidentally moved that no harm would occur.

Personnel operating and working with machinery must not wear loose, dangling or unbuttoned clothing that could tangle in machinery.



WARNING: AVOID HIGH-PRESSURE FLUIDS

1. Escaping fluid under pressure can penetrate the skin causing serious injury.
2. Shut off tractor before connecting or disconnecting hydraulic lines at tractor.
3. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hand and body away from pinholes and components that may eject fluids under pressure. Use a piece of cardboard to search for leaks.
4. If ANY fluid is injected into the skin, a doctor familiar with this type of injury must surgically remove it immediately .

RAKING POSITIONS BASKET RAKE



CAUTION: See safety messages on previous page before attempting any of these procedures.

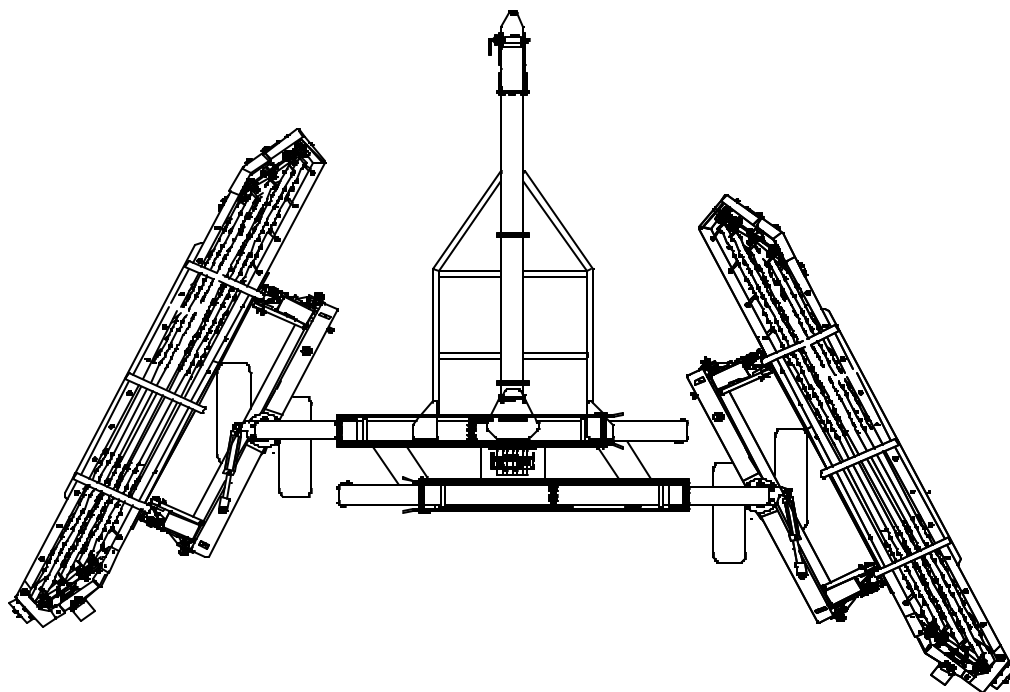
Turning Two Windrows Out

The uniqueness of the 8803 with its 360 degree swivel swing arm allows the raking of hay out, which enables the operator to combine 3 or more windrows in tighter cuttings.

To obtain this position each basket must be changed from one side to the other.

NOTE:

- 1) Open the main frame with baskets in transport position.
- 2) With the aid of a front-end loader remove the baskets and set them on the ground.
- 3) Pull the frame away from basket. Turn frame around and pull back over the top of the baskets.
- 4) Install the baskets on the opposite swing arms.
- 5) Rotate swing arms to the outside; reconnect hydraulic hoses.
- 6) Before removing hydraulic hoses, mark hoses for proper reinstallation.



NOTES

**OPERATION
OF THE
8803 RAKE**

TOPICS:

START-UP

OPERATION

SHUT-DOWN

EMERGENCY PROCEDURES

STARTUP 8803 RAKE

ACCIDENTS CAN BE PREVENTED

Without the complete cooperation of the implement operator, no accident prevention program can be successful. The operator anticipating the results before an accident occurs and taking action to remedy the situation can prevent many accidents. No power driven equipment, whether it be for transportation or processing, whether it is used on the highway, in the field, or in the shop, can be safer than the person at the controls. If accidents are to be prevented, the operators who accept these responsibilities seriously will accomplish it. Elimination of careless acts and unsafe operation will be a help in getting your safety program off to a good start.

READ THE OPERATORS MANUAL – BE ALERT



CAUTION

1. **Never connect hydraulic lines or operate any portion of the machine unless machine is hitched to tow vehicle or tractor.**
2. **Do not operate hydraulic systems when hydraulic leaks are present.**
3. **Never ride on the machine during transport or movement.**
4. **Always observe local traffic laws when transporting unit on public roads.**
5. **Always operate machine in a careful, controlled manner.**
6. **Personnel operating and working with this machinery and in any related duties must be properly trained and free of conditions or substances that may impair safety or good judgment.**
7. **Personnel operating and working with this machinery must not wear loose, dangling or unbuttoned clothing that could tangle in machinery.**
8. **Do not exceed 90 rpm basket speed or serious rake damage may result.**
9. **Always stay clear of parts that can move and entangle, pinch or crush.**
10. **System Hydraulic pressure is to be set at minimum possible for proper operation. DO NOT EXCEED 2000-psi WORKING PRESSURE OR 2700 psi MAXIMUM PRESSURE.**
11. **Keep out of machine when in use.**
12. **Before starting machine, always check area around machine to verify that all personnel are clear.**
13. **Daily inspect fasteners for tightness (bolts, pins, etc.).**

READ AND OBSERVE SAFETY SIGNS

RAKING POSITIONS BASKET RAKE



CAUTION: See safety messages on previous page before attempting any of these procedures.

PREPARATION FOR START-UP

Before starting the rake, the following should be accomplished:

1. Operator has reviewed and understood all of the safety messages in this manual.
2. Operator has become familiar with all of the controls and rake setting as described in this manual.
3. The rake has been properly hitched to the tractor as described in the “*SET-UP*” section of this manual.
4. Operator has given the rake an inspection for machine condition.
5. The rake hoses have been properly connected to the tractor remote connectors as per the section “*ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM*” in this manual.
6. The rake hydraulic system has been properly set according to the instructions in “*UNDERSTANDING THE ALLEN RAKE HYDRAULIC SYSTEM*”, and “*ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM*” in this manual.
7. The rake has been set, according to this manual, for: level frame, basket tilt, basket angle, and tine adjustment.
8. Tractor has been verified to have a new or clean hydraulic filter.
9. Tractor reservoir is full with clean hydraulic oil.
10. Control console has been affixed securely near convenient reach of the operator’s position in the tractor seat.

START-UP

After completion of the “*PREPARATION FOR START-UP*”, do the following:

1. Crank tractor and let engine idle out of gear and with tractor brake applied.
2. Slowly start the tractor remote hydraulic system per the recommended method for hydraulic motor operation in the tractor manual.
3. Slowly increase the tractor engine speed to operational field rpm (usually 2000-2500 rpm). See tractor manual for details.
4. The basket should be rotating at 85-90 rpm. Place the tractor in proper gear and gently begin traveling.

OPERATION 8803 RAKE



CAUTION: See safety messages on previous page before attempting any of these procedures.

ACCIDENTS CAN BE PREVENTED

Without the complete cooperation of the implement operator, no accident prevention program can be successful. The operator anticipating the results before an accident occurs and taking action to remedy the situation can prevent many accidents. No power driven equipment, whether it be for transportation or processing, whether it is used on the highway, in the field, or in the shop, can be safer than the person at the controls. If accidents are to be prevented, the operators who accept these responsibilities seriously will accomplish it. Elimination of careless acts and unsafe operation will be a help in getting your safety program off to a good start.

READ THE OPERATORS MANUAL – BE ALERT



CAUTION

1. Do not operate hydraulic systems when hydraulic leaks are present.
2. Never ride on the machine during transport or movement.
3. Always observe local traffic laws when transporting unit on public roads.
4. Personnel operating and working with this machinery and in any related duties must be properly trained and free of conditions or substances that may impair safety or good judgment.
5. Personnel operating and working with this machinery must not wear loose, dangling or unbuttoned clothing that could tangle in machinery.
6. Do not exceed 90-rpm basket speed or serious rake damage may result.
7. Always stay clear of parts that can move and entangle, pinch or crush.
8. System hydraulic pressure is to be set at minimum possible for proper operation. **DO NOT EXCEED 2000-psi WORKING PRESSURE OR 2500 psi MAXIMUM PRESSURE.**
9. Keep out of machine when in use.

MAXIMUM FIELD SPEED NOT TO EXCEED 7 MPH.
READ AND OBSERVE SAFETY SIGNS.

OPERATION 8803 RAKE



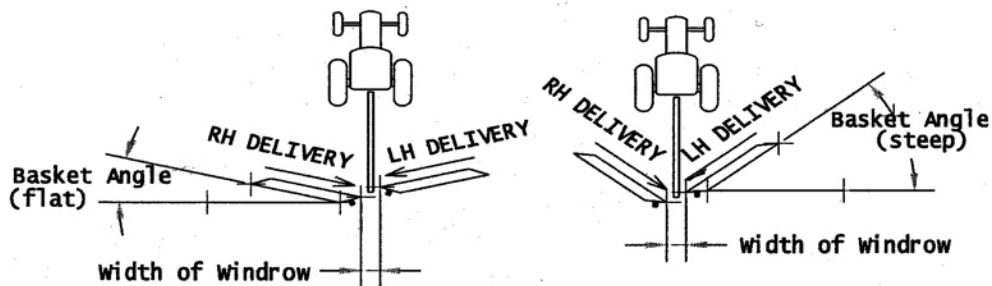
CAUTION: See safety messages on previous page before attempting any of these procedures.

PREPARATION FOR OPERATION

To operate the rake, the steps must be completed as shown in the sections of this manual “*PREPARATION FOR START-UP*”, and “*START-UP*”. At the end of the “*START-UP*” procedures, the rake is being towed by the tractor in the field.

OPERATION

1. Setting the Rake Position.



The desired “Width of Windrow” is maintained by adjusting the Basket Angle and the position of the Telescoping Extension Arms.

The following relationships apply:

A steeper basket angle allows a faster ground speed in heavy hay.

A steeper basket angle assists gentler handling of the crop (leaf retention).

A more flat basket angle allows for a wider swath.

2. If the rake has difficulty in heavy hay, the following applies:
 - ~~///~~ Verify that the baskets are at 85-90 RPM, but no faster.
 - ~~///~~ Have the tractor pump checked (pressure, flow rate, slippage).
 - ~~///~~
3. Depress clutch to maintain engine RPM and reduce ground speed when approaching heavy clumps of hay.
4. Remember that the baskets must be rotating for the other rake control to work.
5. Raise baskets when turning the tractor, as at the end of a swath.

OPERATION 8803 RAKE



CAUTION: See safety messages on previous page before attempting any of these procedures.

OPERATION, (continued)

6. If basket “carry's over” with hay, then the basket RPM is likely too fast for the crop condition and ground speed.
7. If the front of the basket dips down so that the tines are contacting the ground, then there is likely too much loose motion in the extension arms. This can be remedied by installation of Half-Shims behind the Poly-Slide Bearings. See “*MAINTENANCE*” Section for proper placement and installation instructions.
8. Occasionally the basket may load up with hay and stall or jam. If this occurs, utilize the following procedures:
 - A. Allow the basket to clear itself with the operator staying in the tractor seat using a suitable combination of the following efforts:
 - ~~///~~ Raising the Basket.
 - ~~///~~ Depressing the clutch to slow the tractor while maintaining engine RPM.
 - ~~///~~ Breaking the tractor to a full stop, then slowly backing up, if necessary.
 - ~~///~~ Starting and stopping the tractor hydraulics in order to repeatedly start and stop the rake basket.
 - B. Shut off the tractor. Very carefully, remove the jammed hay.



CAUTION

Read all SAFETY MESSAGES at the beginning of this manual before attempting any of the procedures described in this section.

Regard especially the following:

BEFORE APPROACHING OR ENTERING ANY MECHANISM TO SERVICE, INSPECT, OR MAKE ADJUSTMENTS:

- A. LOWER UNIT TO THE GROUND.
- B. SHUT THE TRACTOR OFF.
- C. LOCK THE TRACTOR'S PARKING BRAKE.
- D. REMOVE THE KEY.

STAND CLEAR

Look around to be sure that if something slipped or accidentally moved that no harm would occur.

Personnel operating and working with machinery must not wear loose, dangling or unbuttoned clothing that could tangle in machinery.

SHUTDOWN 8803 RAKE



CAUTION: See safety messages on previous page before attempting any of these procedures.

SHUT-DOWN

1. Prior to shutting off the tractor hydraulic system, operate the rake hydraulic system as required (basket cylinders, extension arms, etc.)
2. Shut off the tractor hydraulic system.
3. Place the tractor in the proper parking gear and apply parking brake. Shut off engine.
4. Review the sections in this manual that pertain to the next anticipated function, such as:

~~///~~ SAFETY PRECAUTIONS
~~///~~ JACK OPERATION – hitching and unhitching
~~///~~ TRANSPORTING THE RAKE
~~///~~ MAINTENANCE

EMERGENCY PROCEDURES

8803 RAKE

1. Before an emergency occurs know all the safety information relating to this machinery, its related systems and components, associated equipment (example: tractor, tow vehicle, etc.) and any chemicals used in relation to this equipment.

Below are a few of the safety messages in this manual. You should review all relevant safety information.

ACCIDENTS CAN BE PREVENTED

Without the complete cooperation of the implement operator, no accident prevention program can be successful. The operator anticipating the results before an accident occurs and taking action to remedy the situation can prevent many accidents. No power driven equipment, whether it be for transportation or processing, whether it is used on the highway, in the field, or in the shop, can be safer than the person at the controls. If accidents are to be prevented, the operators who accept these responsibilities seriously will accomplish it. Elimination of careless acts and unsafe operation will be a help in getting your safety program off to a good start.

READ THE OPERATORS MANUAL – BE ALERT



CAUTION

BEFORE APPROACHING OR ENTERING ANY MECHANISM TO SERVICE, INSPECT, OR MAKE ADJUSTMENTS:

- A. LOWER UNIT TO THE GROUND.
- B. SHUT THE TRACTOR OFF.
- C. LOCK THE TRACTOR'S PARKING BRAKE.
- D. REMOVE THE KEY.

PREPARE FOR EMERGENCIES

Be prepared in the event of personal injury, fire, or environmental problem.

Keep handy a first aid kit, tools, equipment, supplies, fire extinguisher, and proper attire for handling chemicals associated with the machinery usage.

Keep handy the emergency numbers for doctors, ambulance service, hospital, fire department, and any other emergency personnel.

EMERGENCY PROCEDURES 8803 RAKE



WARNING: AVOID HIGH-PRESSURE FLUIDS

1. Escaping fluid under pressure can penetrate the skin causing serious injury.
2. Shut off tractor before connecting or disconnecting hydraulic lines at tractor.
3. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hand and body away from pinholes and components that may eject fluids under pressure. Use a piece of cardboard to search for leaks.
4. If ANY fluid is injected into the skin, a doctor familiar with this type of injury must surgically remove it immediately.

Before an emergency occurs, have a clear understanding with associated personnel of signals, procedures, and words to use in the event of an emergency. Avoid communication that could be confused (example: “NO!” and “GO!” sound alike, especially in a noisy environment).

2. In the event of an emergency, judge the situation quickly, then take appropriate action. Such action may include:

- ~~///~~ Relieving the harmful situation using the machinery controls.
- ~~///~~ Shutting off power to the machinery.

In the rush of handling emergencies, always keep safety in mind so as to avoid further injury or damage.

3. If it necessary to operate the rake hydraulic cylinders without operation of the rake baskets, there is a method. THIS IS A TEMPORARY MEASURE. REVIEW ALL OF THE SAFETY MESSAGES AT THE BEGINNING OF THIS MANUAL PRIOR TO ATTEMPT-



CAUTION

BEFORE APPROACHING OR ENTERING ANY MECHANISM TO SERVICE, INSPECT, OR MAKE ADJUSTMENTS:

- A. LOWER UNIT TO THE GROUND.
- B. SHUT THE TRACTOR OFF.
- C. LOCK THE TRACTOR'S PARKING BRAKE.
- D. REMOVE THE KEY.

ALWAYS STAY CLEAR OF PARTS THAT CAN MOVE AND ENTANGLE, PINCH OR CRUSH.

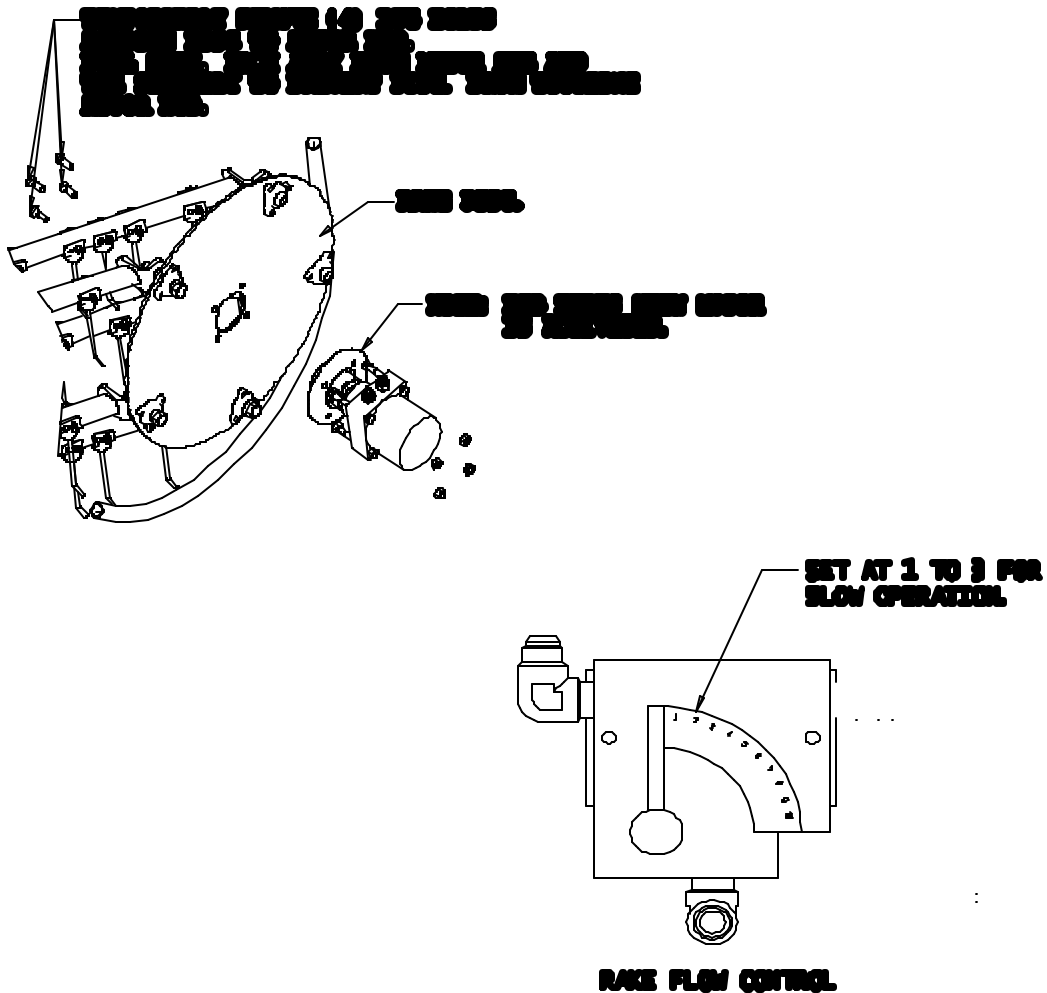
SHUTDOWN 8803 RAKE



WARNING CAUTION

Read all safety messages on previous page before attempting any of these procedures.

4. Disconnect the lug bolts that attach the rake disc wheel to the hub at the hydraulic motor. Safely tie back the tines and disc wheel from the hub. (The hub will be turning once the rake is started.) Set rake flow control to a lower setting (2 TO 3 SUGGESTED). OPERATE THE RAKE IN THIS CONDITION ONLY LONG AS NECESSARY TO RELIEVE



THE BASKET RAKE

HYDRAULIC SYSTEM

TOPICS:

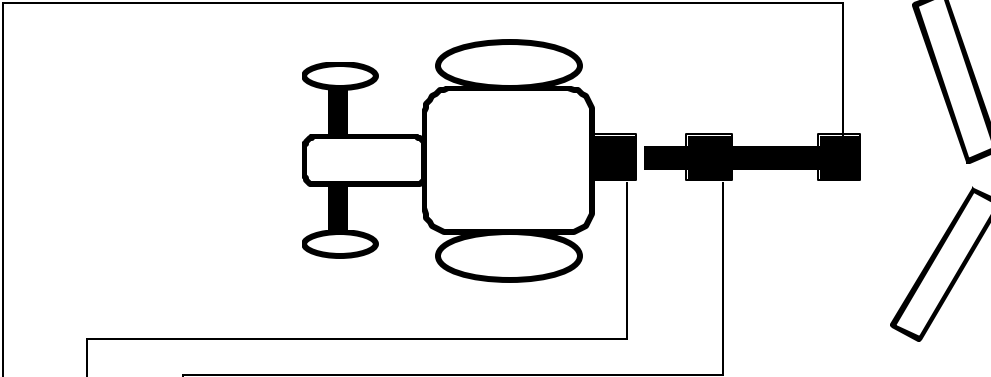
UNDERSTANDING THE ALLEN HYDRAULIC SYSTEM

ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM

UNDERSTANDING THE RAKE HYDRAULIC SYSTEM

In order for the basket rake to work properly, and in order to realize the longest possible life from your rake, the hydraulic adjustments for the rake must be set properly.

WHAT DOES THE RAKE NEED?



1. PROPERLY SET FLOW CONTROL AND BALL VALVE ON RAKE
2. TRACTOR HYDRAULIC OUTPUT THAT IS:

SUFFICIENT: THE HYDRAULIC REQUIREMENTS IS 14 GPM. MINIMUM.

~~///~~ CONSTANT: WITHOUT SURGES, OR VARYING FLOWS ONCE THE ENGINE RPM IS SET TO OPERATING SPEED.

~~///~~ BALANCED: THE TRACTOR HYDRAULIC FLOW RATE SETTING AND RAKE FLOW CONTROL SETTING ARE TO BE MATCHED.

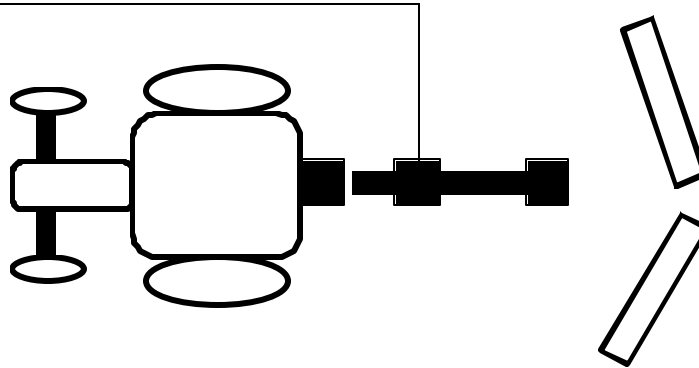
IF THE TRACTOR HYDRAULIC REMOTE HAS A FLOW CONTROL, IT MUST BE SET TO SUPPLY THE SAME AS (OR BARELY ABOVE) THE RAKE FLOW CONTROL SETTING. THIS WILL MINIMIZE EXCESS HYDRAULIC SUPPLY "PUSHING" AGAINST THE RAKE FLOW CONTROL.

3. PROPERLY SET PRESSURE RELIEF ON THE SPOOL VALVE:

MUST HAVE ENOUGH PRESSURE TO OPERATE THE HYDRAULIC CYLINDERS AS NEEDED, WHILE MINIMIZING ANY SLOWING OF BASKET ROTATION DURING CYLINDER OPERATION.

UNDERSTANDING THE RAKE HYDRAULIC SYSTEM

1. UNDERSTANDING THE FLOW CONTROL ON THE RAKE



An understanding of these components is very important. You may indeed check their adjustments several times while getting the rake set-up to run with each different tractor.

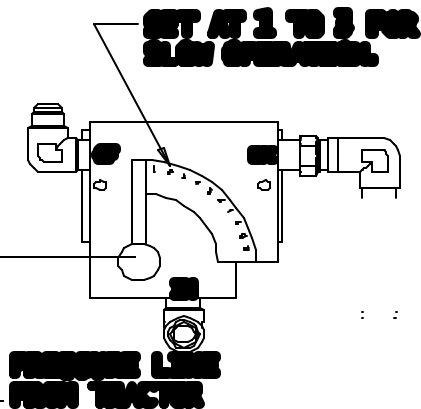
The pressure gauge has been eliminated. Most of today's tractors have hydraulic monitoring systems which eliminates the need for a pressure gauge. However, gauges can be provided per customer request.

SIDE-LEVER adjusts the amount of flow allowed to the motors. The 0—10 digits are reference numbers for ease in repeating a certain setup. The numbers **DO NOT**

See open/close center operation in the back back of this manual, open or closed depending on the type of hydraulic system on the tractor.

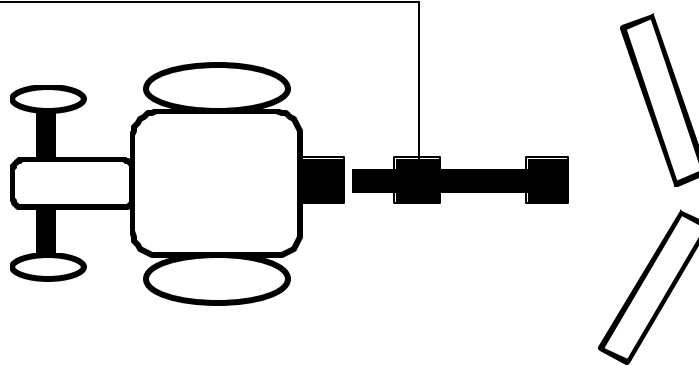
See your tractor manufacture to determine open/close center system your tractor is.

The ball valve setting will be discussed in more detail in the section "*ADJUSTING THE RAKE HYDRAULIC SYSTEM*".



UNDERSTANDING THE RAKE HYDRAULIC SYSTEM

1. UNDERSTANDING THE FLOW CONTROL AND BALL VALVE ON THE RAKE (CONTINUED)

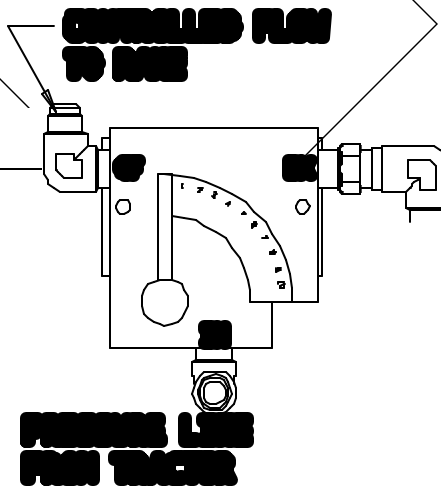


Understanding these features is very important. You can better troubleshoot your rake if you understand these features.

“CF” is the controlled flow part that provided metered flow to the rake.

“EX” is the port for excess flow that is not needed to run the rake. This flow is returned to the tractor reservoir.

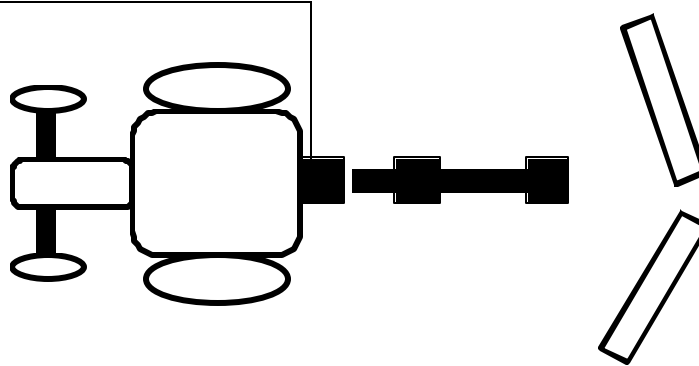
The COMPENSATING SPOOL is inside of the FLOW CONTROL VALVE and is not adjustable. The compensating spool reacts to maintain a constant flow of oil into the rake when there are pressure changes. Pressure changes occur when a cylinder is operated, or when the rake contacts heavy hay, etc.



“IN” is the port where high pressure hydraulic fluid is provided from the tractor hydraulic system.

UNDERSTANDING THE RAKE HYDRAULIC SYSTEM

2. UNDERSTANDING TRACTOR HYDRAULIC OUTPUT AND HOW DIFFERENT TYPES OF TRACTOR HYDRAULIC SYSTEMS AFFECT RAKE ADJUSTMENT AND OPERATION.



ACHIEVING SUFFICIENT HYDRAULIC FLOW FOR RAKE OPERATION

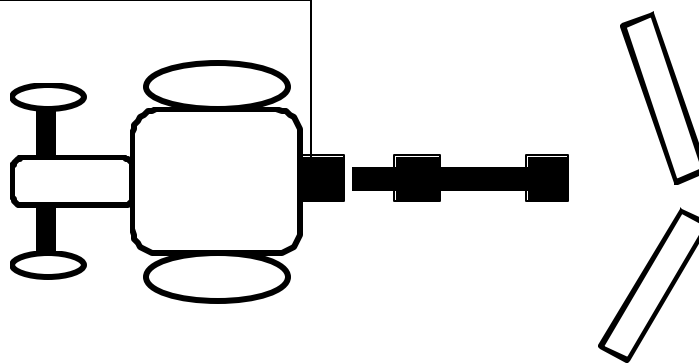
THE ALLEN RAKE WITH IT'S HEAVY DUTY MOTORS NEEDS:
14 gallons per minute minimum at the operational pressure.
The tractor should be rated higher than 14 GPM to allow for inefficiencies in the tractor pump and rake motors that occur with wear.

IMPORTANT: THE FLOWS STATED ABOVE ARE FOR THE RAKE BASKET TO ROTATE 90 RPM. BASKET SPEEDS FASTER THAN 90 RPM CAN CAUSE SEVERE DAMAGE TO THE RAKE.

UNDERSTANDING THE RAKE HYDRAULIC SYSTEM

2. UNDERSTANDING TRACTOR HYDRAULIC OUTPUT AND HOW DIFFERENT TYPES OF TRACTOR HYDRAULIC SYSTEMS AFFECT RAKE ADJUSTMENT AND OPERATION.

(CONTINUED)



ACHIEVING SUFFICIENT HYDRAULIC FLOW FOR RAKE OPERATION

Hydraulic flow that is “constant” means flow without surges, or other variances, once the engine rpm is set to operating speed.

PERFECTLY CONSTANT FLOW IS NOT POSSIBLE. However, the hydraulic controls on the rake allow for settings that minimize surging and other variances of supply flow into the rake.

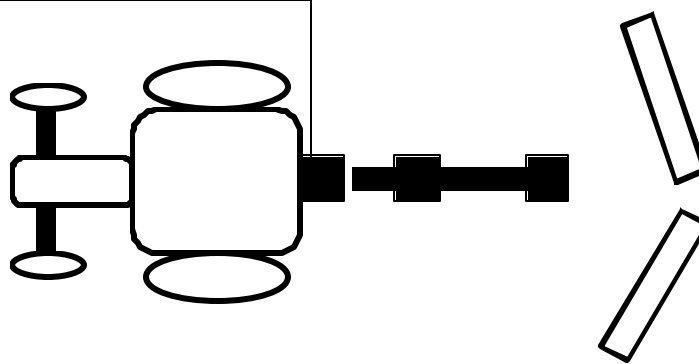
Surges and other variances in flow cause problems such as over speeding of the basket after a cylinder is actuated or the baskets raising “by themselves” while raking hay.

ACHIEVING CONSTANT FLOW USING A TRACTOR WITH BASIC OPEN-CENTER OR BASIC CLOSED-CENTER HYDRAULIC SYSTEM.

The settings are the simplest, when connecting to tractors that utilize a basic open-center, or basic closed-center hydraulic system. With these tractors, once the engine rpm is set, the hydraulic flow to the rake remains approximately the same. Starting with the rake flow control set near 0 (zero), the side lever arm of the rake flow control is rotated clockwise until the basket is counted to be rotating at 90 RPM. The thumbscrew of the side lever spool is then tightened finger tight to retain the adjustment.

UNDERSTANDING THE RAKE HYDRAULIC SYSTEM

2. UNDERSTANDING TRACTOR HYDRAULIC OUTPUT AND HOW DIFFERENT TYPES OF TRACTOR HYDRAULIC SYSTEMS AFFECT RAKE ADJUSTMENT AND OPERATION. (CONTINUED)



OBTAINING CONSTANT FLOW USING A TRACTOR WITH BUILT-IN FLOW CONTROLS and THE IMPORTANCE OF BALANCED FLOW.

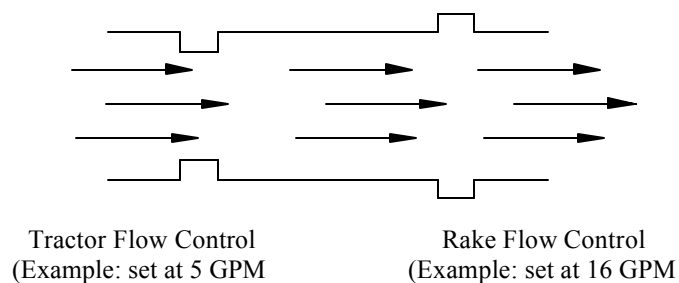
Tractors with built-in flow controls pose a special problem. Which flow control is to be used to actually control the rake?

Some tractors literature states that only the tractor flow control should be used, and any implement flow control should be opened to full-flow to reduce any restrictions (hence, heat build-up, etc.) in the hydraulic circuit. Whereas, this may indeed assure that the tractor is not “pushing” too much flow at the rake flow control, this method does not provide for constant flow. Here’s why:

In the following scenario (figure A), the tractor flow control is providing the only flow-control restriction in the circuit. What happens if the tractor suddenly sends a surge of fluid (engine is revved higher, or pressure compensation “kicks in”)? Or, what happens if the tractor suddenly reduces the flow (engine RPM slowed, etc.)? The rake flow control is opened too much. Such that:

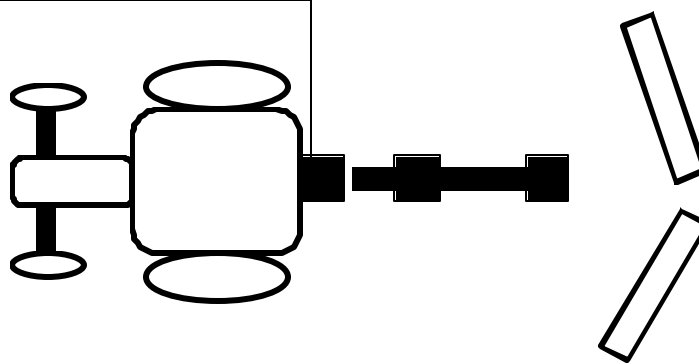
- The basket rotation over speeds, at times. (The rake flow control provides no protection against surges from the tractor.)
- The basket rotation slows, at times. (The rake flow control is creating no back pressure in the supply line. A slight amount of back-pressure is needed in the supply line during normal operation, so that if, for instance, the tractor engine rpm is reduced, then the back-pressure in the supply line may decrease, but the flow to the rake and the basket rotation speed will remain fairly constant.)

Figure A—Simplified Diagram of Flow Controls



UNDERSTANDING THE RAKE HYDRAULIC SYSTEM

2. UNDERSTANDING TRACTOR HYDRAULIC OUTPUT AND HOW DIFFERENT TYPES OF TRACTOR HYDRAULIC SYSTEMS AFFECT RAKE ADJUSTMENT AND OPERATION. (CONTINUED)



OBTAINING CONSTANT FLOW USING A TRACTOR WITH BUILT-IN FLOW CONTROLS and THE IMPORTANCE OF BALANCED FLOW. (continued)

What can happen if the tractor flow control is either fully opened or opened too much, and the rake flow control is used to control the flow? See Figure B.

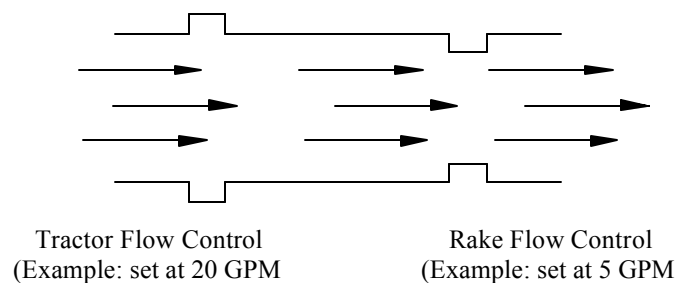
- a. Excess heat builds up in the fluid any time that excess fluid is pushed over a relief valve, or through a flow control valve. Hot fluid degrades more quickly, can harm the hydraulic components, and may result in reduced basket rpm.
- b. Tractors with pressure sensing or load sensing hydraulic systems may send unpredictable surges of fluid into the rake flow control, or may try to supply a steady, very high pressure (2500+ psi). Operational symptoms may include:

Tractor hydraulic system emits a “whistling” sound.

Rake pressures over 1000 psi with the rake stationary, the baskets at 90 RPM, and no cylinders being operated.

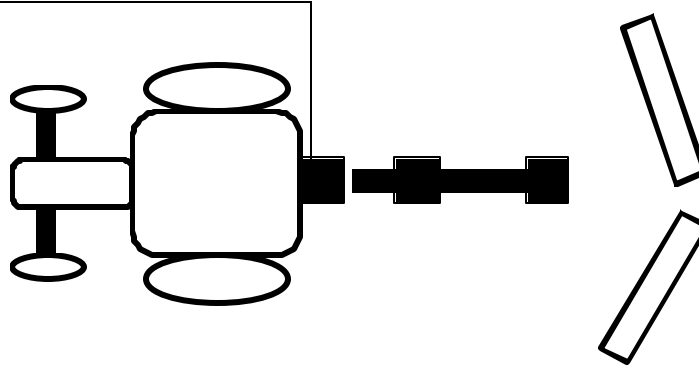
After the control handle is released from operating a rake cylinder, the rake baskets momentarily over speed, sometimes allowing the tine bars to clatter against the rake framework. The rake baskets creep upward “by themselves” while the rake is being towed across a field.

Figure B—Simplified Diagram of Flow Controls



UNDERSTANDING THE RAKE HYDRAULIC SYSTEM

2. UNDERSTANDING TRACTOR HYDRAULIC OUTPUT AND HOW DIFFERENT TYPES OF TRACTOR HYDRAULIC SYSTEMS AFFECT RAKE ADJUSTMENT AND OPERATION.
(CONTINUED)



OBTAINING CONSTANT FLOW USING A TRACTOR WITH BUILT-IN FLOW CONTROLS and THE IMPORTANCE OF BALANCED FLOW. (continued)

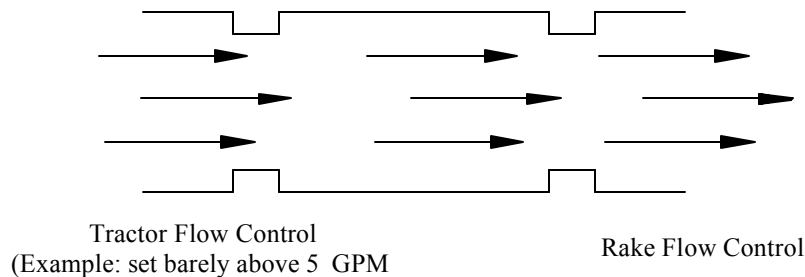
What is the optimum setting for the flow controls of the tractor and the rake in order to achieve the best rake life and performance? See Figure C.

Note of Caution: The following instructions should be compared with the technical instructions for your tractor. If there seems to be a difference, then call a service representative from your tractor company. The ALLEN RAKE is similar to many implements that have hydraulic motors requiring definitive control for which your tractor company should provide technical support.

The optimum setting of the flow control for the rake is the BALANCED condition as shown in Figure C. A step-by-step method for achieving balanced flow controls is described farther on in these hydraulic instructions.

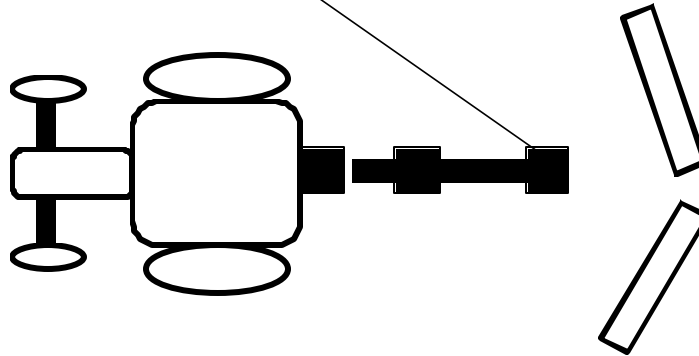
The Balanced Flow Control condition utilizes the assumption that since the tractor has flow controls, it is internally equipped to properly manage excess flow capacity, rather than sending the excess flow externally to the rake flow control where heat will be added to the hydraulic fluid.

Figure C—Simplified Diagram of Flow Controls



UNDERSTANDING THE RAKE HYDRAULIC SYSTEM

3. UNDERSTANDING THE PRESSURE RELIEF ON THE SPOOL VALVE



The purpose of the pressure relief valve on the spool valve (rake control valve) is to provide enough back-pressure in the hydraulic circuit to operate a hydraulic cylinder when a control lever is actuated.

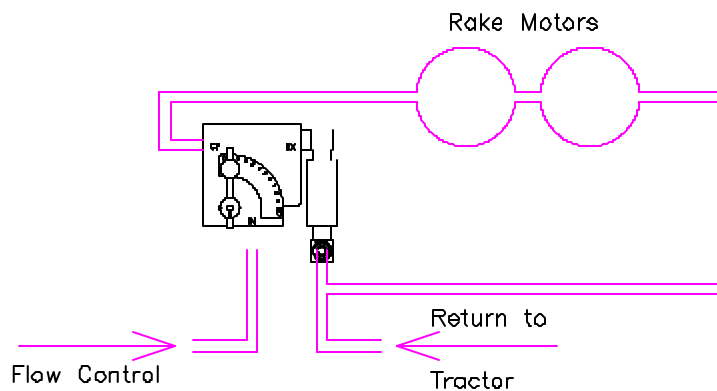
This back pressure from the spool valve pressure relief is active in the system only when a control handle is actuated. When all control handles are at rest, then the hydraulic fluid flows through the spool valve (with no relief valve back pressure) and returns to the tractor. See Figure D.

Some relationships to remember when adjusting this valve are:

A higher pressure setting will yield more cylinder force, and slower basket rotations when a control lever is actuated.

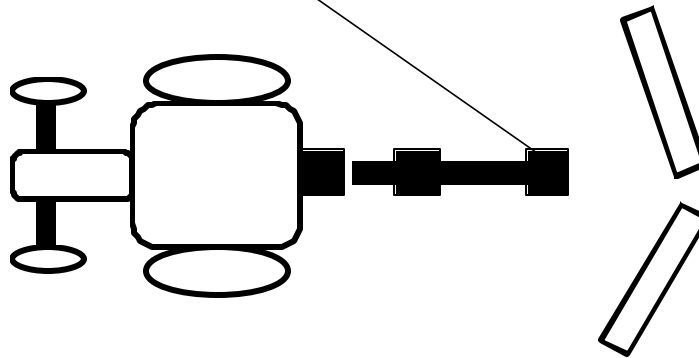
A lower pressure setting will yield less cylinder force, and faster basket rotations when a control lever is actuated.

Figure D. – Simplified Diagram of Flow through Motors. THERE IS A SEPARATE SUPPLY FOR THE SPOOL VALVE ON THE 8803 RAKE.



UNDERSTANDING THE RAKE HYDRAULIC SYSTEM

3. UNDERSTANDING THE PRESSURE RELIEF ON THE SPOOL VALVE



These relationships of cylinder force vs. basket rotation speed during the time that a control lever is actuated show that:

The optimum setting for the Spool Valve Pressure Relief is to be:

High enough for sufficient cylinder force in all operational conditions, but as low as allowable so that there will be some basket rotation maintained during the time when a control lever is actuated.

Any pressure relief setting should be verified with actual worst-case raking conditions.

Helpful Hint:

The Telescoping Cylinders often require the highest pressure to operate. These cylinders widen and narrow the overall width of the rake baskets. Keeping some dry lubrication light to be used for applying to the extension tubes and Poly-Slide Bearings can reduce the hydraulic pressure required to operate the telescoping cylinders.

To keep the rake basket from stalling during actuation of a rake control lever, the tractor relief valve must be set to a higher pressure than the relief valve on the rake spool valve. Consult tractor technical information for these adjustments.

For the rake basket to rotate during the time that a control lever is actuated is not essential, but it is desirable, if possible.

NOTES

ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM

NOTE: THIS ADJUSTMENT NEEDS TO BE MADE, OR VERIFIED, EACH TIME THAT A RAKE IS CONNECTED TO A RAKING TRACTOR.

A. TO ADJUST THE RAKE HYDRAULIC SYSTEM, YOU WILL NEED THE FOLLOWING SUPPLIES AND EQUIPMENT:

Safety Glasses, Gloves, Shop Cloths, hand tools and other supplies needed for working safely with machinery and hot hydraulic equipment.

Stop Watch or Watch that displays seconds. 0-3000 psi gauge connected to hydraulic line at the inlet to the rake flow control. Permanent Marker or Paint Stick.



CAUTION

IT IS IMPERATIVE THAT THE OPERATOR UNDERSTANDS THE TRACTOR HYDRAULIC SYSTEM. SETTING UP THE RAKE IN A MANNER INCOMPATIBLE WITH THE TRACTOR MAY CAUSE UNEXPECTED OPERATING CONDITIONS RESULTING IN HARM TO PERSONS OR EQUIPMENT. REQUIREMENTS FOR THE ALLEN RAKE, EXPLAINED IN THE PREVIOUS SECTION, ARE SIMILAR TO OTHER IMPLEMENTS WITH HYDRAULIC MOTORS. CONSULT THE MANUAL AND TECHNICAL STAFF FOR YOUR TRACTOR. VERIFY THAT THE TRACTOR STEERING, BRAKES, AND OTHER FUNCTIONS OPERATE PROPERLY WHILE OPERATING THE RAKE.

B. TO ADJUST THE RAKE HYDRAULIC SYSTEM, YOU WILL NEED TO DETERMINE THE FOLLOWING INFORMATION ABOUT YOUR RAKING TRACTOR.

Type of Hydraulic System:

- Open Center
- Closed Center
- Open Center with Load Sensing or Pressure Sensing
- Closed Center with Load Sensing or Pressure Sensing
- Other Hydraulic Features of the Tractor

What does your tractor manual recommend for operation of a hydraulic motor from the hydraulic remote connections? What is the best control lever position?

Are accessories recommended (oil cooler, etc.) for your tractor to continuously operate a hydraulic motor?

Does operation of the tractor hydraulic remotes result in difficulty of steering and other tractor operator functions?

Does the tractor have its own flow controls for the hydraulic remotes?

Is it possible to connect the rake hydraulic return line directly to a remote coupler on the tractor reservoir – instead of allowing the rake return fluid to pass through the hydraulic valve?

ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM

NOTE: On many tractors with load sensing or pressure sensing, it is best to port the rake return directly to the tractor reservoir. This can help to reduce the flow surges due to the tractor sensing circuit.

C. ADJUSTING THE RAKE HYDRAULIC SYSTEM.



CAUTION

BEFORE ATTEMPTING THE FOLLOWING PROCEDURES, READ ALL OF THE SAFETY MESSAGES AT THE BEGINNING OF THE MANUAL. NOTE ESPECIALLY THE FOLLOWING PRECAUTIONS:

- ⌄ Never connect hydraulic lines or operate any portion of the machine unless machine is hitched to tow vehicle or tractor.
- ⌄ Do not operate hydraulic systems when hydraulic leaks are present.
- ⌄ Always operate machine in a careful, controlled manner.
- ⌄ Personnel operating and working with this machinery must not wear loose, dangling, or unbuttoned clothing, which could tangle in machinery.
- ⌄ Do not exceed 90-rpm basket speed or serious rake damage may result.
- ⌄ Always stay clear of parts that can move and entangle, pinch, or crush.
- ⌄ System hydraulic pressure is to be set at minimum possible for proper operation. **DO NOT EXCEED 2000-psi WORKING PRESSURE OR 2700-psi MAXIMUM PRESSURE.**
- ⌄ Keep out of machine when in use.
- ⌄ Before starting the machine, always check area around machine to verify that all personnel are clear.
- ⌄ Always use proper procedures and equipment for handling, transporting, and storing any chemical associated with the usage of the machinery.
- ⌄ Always park machine on flat ground for unhitching or storage. Before unhitching, place chocks in front and behind all transport wheels to prevent rolling when unhitched and parked.
- ⌄ Stand clear of tongue, framework, and tow vehicle or tractor when operating jack or working with hitch. Look around to be sure that if something slipped or accidentally moved that no harm would occur.
- ⌄ Always wear proper safety attire for each usage condition or service procedure.

ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM

C. ADJUSTING THE RAKE HYDRAULIC SYSTEM. (continued)



CAUTION

BEFORE ATTEMPTING THE FOLLOWING PROCEDURES, READ ALL OF THE SAFETY MESSAGES AT THE BEGINNING OF THE MANUAL. NOTE ESPECIALLY THE FOLLOWING PRECAUTIONS:



WARNING: AVOID HIGH-PRESSURE FLUIDS

1. Escaping fluid under pressure can penetrate the skin causing serious injury.
 2. Shut off tractor before connecting or disconnecting hydraulic lines at tractor.
 3. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hand and body away from pinholes and components that may eject fluids under pressure. Use a piece of cardboard to search for leaks.
 4. If ANY fluid is injected into the skin, a doctor familiar with this type of injury must surgically removed immediately.
-
1. Make sure that the rake hydraulic lines ARE NOT connected to the tractor.
 2. As per the safety messages, hitch the rake to the tractor and connect the hydraulic lines.
 3. Before turning on the tractor hydraulics, first set the rake flow control side lever to 2-1/2.
 4. Set the valve to open or closed, as required for the type of tractor hydraulic system.
See figure, below: *Rake Flow Control*

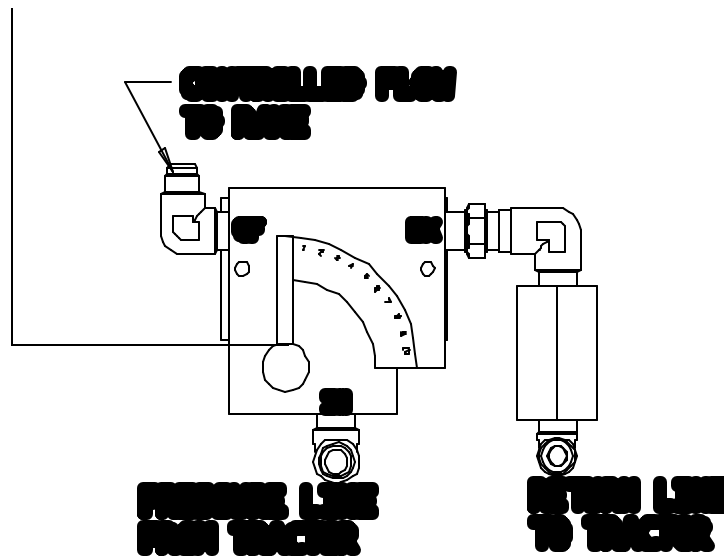
ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM

C. ADJUSTING THE RAKE HYDRAULIC SYSTEM. (continued)

The SIDE-LEVER set to 2-1/2.

NOTE:

The 0—10 digits are reference numbers for ease in repeating a certain setup. These numbers DO NOT represent a certain flow rate.



5. Next, if the tractor has a flow control, set the tractor flow control to the approximate mid-point.
6. From the tractor operator manual, determine the recommended positions of the tractor remote hydraulic levers, etc. for running hydraulic motors. Per the recommendation, slowly turn on the tractor remote hydraulic supply.
7. The hydraulic hose to the "IN" port of the rake flow control should be pressurized. That is, it should stiffen when one of the rake control levers are pulled. If not, then while following recommended safety practices:

ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM

C. ADJUSTING THE RAKE HYDRAULIC SYSTEM. (continued)



CAUTION

BEFORE ATTEMPTING THE FOLLOWING PROCEDURES, READ ALL OF THE SAFETY MESSAGES AT THE BEGINNING OF THE MANUAL. NOTE ESPECIALLY THE FOLLOWING PRECAUTIONS:

- ↓ Using rake control levers, relieve pressure in the rake hydraulic system.
- ↓ Shut off the tractor remote hydraulic supply.
- ↓ Shut off the tractor engine.
- ↓ With the tractor engine shut-off, again use tractor and rake control levers, to try and relieve any pressure in the rake hydraulic system.
- ↓ Now connect the hoses correctly to the tractor.

Repeat all phases of this step until proper hose connection is accomplished:

8. At this point, the rake should be properly connected to the tractor and the baskets should be turning very slowly. To set the baskets to the proper speed of 85 to 90 RPM, do the following:



CAUTION

BEFORE ATTEMPTING THE FOLLOWING PROCEDURES, READ ALL OF THE SAFETY MESSAGES IN THIS MANUAL. NOTE ESPECIALLY:

1. With a watch, time the rotations of the mark on the Disc Wheel. 90 RPM = 90 revolutions in 60 seconds, or 45 revolutions in 30 seconds.
2. At the rake flow control, slowly move the side-lever one or two digits to a higher setting. Count the rake basket RPM.
3. Repeat this step until 85-90 basket RPM is achieved.

NOTE: If the tractor DOES NOT have flow controls, then the flow adjustment for the rake is now complete. Proceed to the instructions for “*Adjustment of the Pressure Relief on the Rake Spool Valve.*”

If the tractor DOES have flow controls, continue with the following instructions.

ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM

C. ADJUSTING THE RAKE HYDRAULIC SYSTEM. (continued)

If the rake will not turn 85-90 RPM with the rake flow control at the highest setting, then:

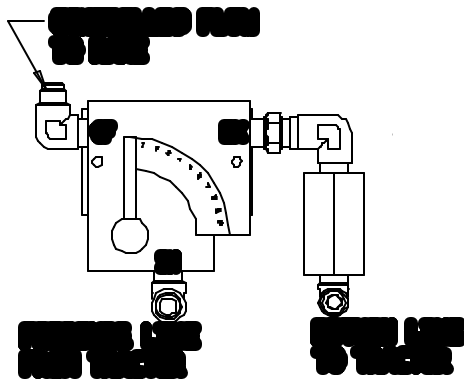
Set the rake flow control side lever to 2- ½, and then increase the tractor flow control 1 turn
Slowly increase the setting of the rake flow control side lever until 85-90 RPM is achieved.

If the rake baskets are rotating faster than 90 RPM then decrease the setting of the rake flow control side lever until 85-90 rpm is achieved.

BALANCING THE TRACTOR FLOW CONTROL AND THE RAKE FLOW CONTROL

To verify that the tractor is trying to supply only slightly more fluid than the rake needs, perform the following steps:?

With the tractor engine at field operational speed (usually 2000-2300 RPM), and the rake basket rotation at 85-90 RPM.



NOTE:

At this point, if the raking tractor hydraulic system DOES NOT have load sensing or pressure sensing then move directly to the instruction for “*ADJUSTMENT OF THE SPOOL VALVE PRESSURE RELIEF.*”

If the raking tractor hydraulic system, DOES have load sensing or pressure sensing continue on in the following instructions.

ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM

C. ADJUSTING THE RAKE HYDRAULIC SYSTEM. (continued)

If you have not done so already, you should read the section of this manual “*UNDERSTANDING THE ALLEN RAKE HYDRAULIC SYSTEM*”. Reading that section will help provide understanding of the cause and effect relationship of the following rake symptoms.

Symptoms of Tractor Flow Control not Balanced with Rake Flow Control:

Symptom: Basket rises by itself while raking hay.

Symptom: After raising the baskets, or operating other cylinders: at the instant that the control lever is released, the baskets over-speed and may even clatter against the frame of the rake.

Symptom: After raising the baskets, or operating other cylinders: after the control lever is released, pressure remains above 1000-2000 psi and does not return to the normal raking pressure of 500-700 psi.

Symptom: Pressure on the rake pressure gauge is continuously above 1000 psi when only the baskets are operating (no cylinders operating). Ideally, after the oil is at operating temperature, the pressure gauge should read 500-700 psi when only the baskets are operating.

Possible Remedies for Above Symptoms:

Read through the section of this manual “*UNDERSTANDING THE ALLEN RAKE HYDRAULIC SYSTEM*”. Then, review the type of system that you are using.

Proceed again through these adjustments instructions and verify that the proper rake and tractor settings are used. Give special attention to the instructions for “Balancing the Tractor Flow Control and the Rake Flow Control”.

ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM

C. ADJUSTING THE RAKE HYDRAULIC SYSTEM. (continued)

If the above remedies do not help, then inquire with your tractor manufacturer's hydraulic staff about the feasibility of connecting the rake return line directly to the tractor reservoir port, instead of having the rake return line connected to a port on a tractor hydraulic remote valve.

Tractor hydraulic systems have evolved much over time, and continue to have new developments. If the tractor cannot seem to be adjusted to operate the rake properly, then use the following rake information to describe the requirements to your tractor manufacturer's hydraulic technical staff if seeking their assistance.

ALLEN RAKE HYDRAULIC SYSTEM:

Operating Flow Rate: 14 gpm Minimum

Flow capacity of Rake Flow Control Valve: 16 gpm

Note: 16 gpm includes the "CF" (controlled flow or operational flow rate) plus the "EX" flow (excess flow not needed and therefore returned to tank).

Pressure requirements for baskets idling at 85-90 rpm (no hay being raked), oil at operating temperature, and no cylinders being operated: 500-700 psi, typical

Pressure requirements for operation of a cylinder:
1500-2000 psi, typical.

The pressure relief on the spool valve used to operate the cylinders sets this pressure.

Maximum tractor hydraulic remote supply pressure = 2500 psi. This is determined by the remote hydraulic system setting of the tractor. Refer to the tractor manual for adjustment instructions.



CAUTION

Certain tractors supply remote hydraulic fluid at pressures above 2500 psi. Although there is a safety factor associated with hydraulic ratings, NEVER ALLOW THE ALLEN RAKE TO BE RUN ON A TRACTOR THAT SUPPLIES REMOTE HYDRAULIC FLUID AT PRESSURE OVER 2700 PSI.

ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM

C. ADJUSTING THE RAKE HYDRAULIC SYSTEM. (continued)

Rake Hydraulic Circuit, Basic Description:

Hydraulic fluid leaves the tractor, passes through a pressure compensated flow control valve, then passes through the first hydraulic motor, then the second hydraulic motor. The hydraulic oil then passes through an open-centered spool valve used to occasionally operate the cylinders, and then the oil passes from this valve to the tractor.

Open center tractor hydraulics:

When oil is in the pressure compensated flow control valve the extra flow not needed for the rake does not pass through the “EX” port. The tractor is supposed to automatically adjust its pump output to the lower flow requirement.

Closed center tractor hydraulics:

When oil is in the pressure compensated flow control valve the extra flow not needed for the rake does not pass through the “EX” port. The tractor is supposed to automatically adjust its pump output to the lower flow requirement.

The pressure relief valve on the spool valve provides pressure when a lever is pulled in order to operate the cylinders.

The check valve allows the rake motors to free wheel and slow down gently when the hydraulic flow is ceased.

Note About Hydraulic Quick Connectors:

Quick Connectors on hydraulic supply hoses: As with any coupler, there may be some restriction in the lines because of these couplers. Quick couplers usually present no problem for rake requirements, but may cause erratic responses in tractors having high capacity pumps with load sensing or pressure sensing hydraulic systems.

ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM

D. ADJUSTING OF THE PRESSURE RELIEF AT THE SPOOL VALVE



CAUTION

BEFORE ATTEMPTING THE FOLLOWING PROCEDURES, READ ALL OF THE SAFETY MESSAGES AT THE BEGINNING OF THE MANUAL. NOTE ESPECIALLY THE FOLLOWING PRECAUTIONS:

- ⌋ Never connect hydraulic lines or operate any portion of the machine unless machine is hitched to tow vehicle or tractor.
- ⌋ Do not operate hydraulic systems when hydraulic leaks are present.
- ⌋ Always operate machine in a careful, controlled manner.
- ⌋ Personnel operating and working with this machinery must not wear loose, dangling, or unbuttoned clothing that could tangle in machinery.
- ⌋ Always stay clear of parts that can move and entangle, pinch, or crush.
- ⌋ System hydraulic pressure is to be set at minimum possible for proper operation. **DO NOT EXCEED 2000-psi WORKING PRESSURE OR 2700-psi MAXIMUM PRESSURE.**
- ⌋ Before starting the machine, always check area around machine to verify that all personnel are clear.
- ⌋ Always use proper procedures and equipment for handling, transporting, and storing any chemical associated with the usage of the machinery.
- ⌋ Always park machine on flat ground for unhitching or storage. Before unhitching, place chocks in front and behind all transport wheels to prevent rolling when unhitched and parked.
- ⌋ Stand clear of tongue, framework, and towing vehicle or tractor when operating jack or working with hitch. Look around to be sure that if something slipped or accidentally moved that no harm would occur.
- ⌋ Always wear proper safety attire for each usage condition or service procedure.
- ⌋ Keep out of machine when in use.

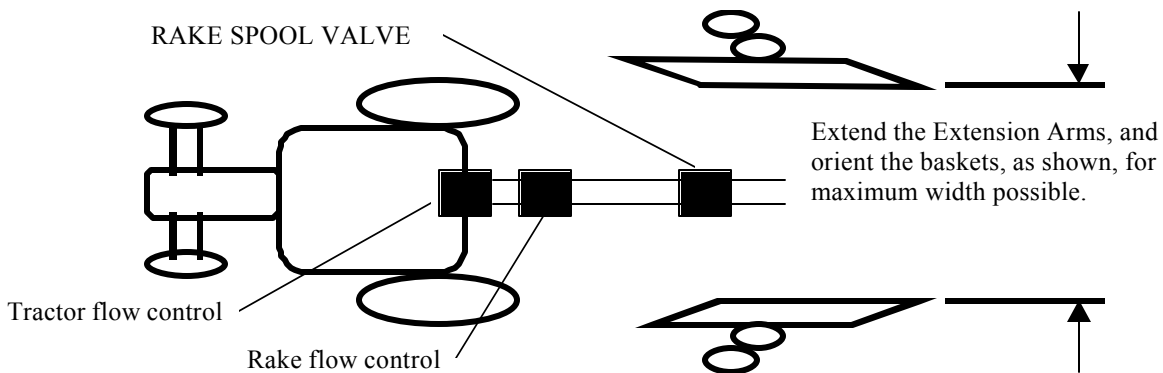
To set the pressure relief at the spool valve follow these steps:

1. Hitch the ALLEN rake to the tractor.
2. Connect the hydraulic hoses to the tractor, and set the hydraulic adjustments as per the instructions in "*C. Adjustment of the ALLEN Hydraulic System*".
3. If the tractor has its own flow controls, make sure that the tractor flow control and the rake flow control are balanced, as per the instructions in "*C. Adjustment of the ALLEN Hydraulic System*".

ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM

D. ADJUSTING OF THE PRESSURE RELIEF AT THE SPOOL VALVE

4. Start the tractor. While driving forward, using the rake control, extend both Extension Arms to allow maximum width between the rake baskets. Next fully pivot both baskets to allow the maximum space between them. See Figure: *Position of Rake Baskets Prior to Servicing Spool Valve*.



5. Using the rake controls, raise the baskets fully. After the baskets have fully risen, continue to hold the rake control in the "Basket Raise" position and at the same time read the pressure from the rake pressure gauge. The pressure reading indicates the setting of the spool valve pressure relief. If the pressure is above 2000 psi, the following conditions may exist:
 - A) The tractor flow control is opened too much and has not been brought into balance with the rake flow control. The tractor has likely already been trying to "push" too much fluid through the rake flow control. The tractor is trying to "push" as much flow into the system as needed to achieve the maximum tractor pressure. (This maximum tractor pressure is the high pressure at which the tractor normally would release a control lever from detent after a remote cylinder has fully extended.) Suggested Remedy: Follow the instructions for "Balancing the Tractor Flow Control and the Rake Flow Control", as seen previously in these instructions.
 - B) The valve on the rake control is improperly set for the type of tractor hydraulic system that is being used. Suggested Remedy: Follow the instructions for adjusting the rake flow control valve. Note especially the sections regarding the setting of the rake spool valve.
 - C) The tractor has a large capacity pump such that the 14 gallon per minute minimum requirement for proper rake operation is a "low" flow for the tractor. The tractor load sensing or pressure sensing function responds erratically at the "low" flow of 14 gallons per minute. Suggested Remedy: Consult with your tractor manufacturer hydraulic staff to determine a mean of connecting the rake or setting the tractor that will allow proper rake operation.
 - D) The pressure relief of the spool valve needs to be set. Remedy: Proceed through the remainder of these instructions:

ADJUSTING THE ALLEN RAKE HYDRAULIC SYSTEM

D. ADJUSTING THE PRESSURE RELIEF AT THE SPOOL VALVE

To adjust the setting of the pressure relief valve at the spool valve, the following objectives must be kept in mind.?

- ↳ System back pressure due to the pressure relief valve must not exceed 2000 psi. Typical settings range from 1500 to 2000 psi.
- ↳ Enough back pressure to operate all of the cylinders. The extension cylinders are usually the most difficult and should be used to verify proper adjustment.
- ↳ No more back pressure than is necessary, since a higher back pressure reduces the basket speed during cylinder operation. Helpful Hint: Keeping aerosol lubricant (drying type) handy to apply on the extension tubes and poly wear pads can reduce the hydraulic pressure setting required to extend and retract the extension arms.



NOTICE

Tractor must be towing rake while the extension arms are being extended or retracted. Rake **MUST NOT** be sitting still or else damage to the tires or rake is likely to occur.

Never operate a rake with the extension arms fully extended. If an extension arm fully extends, you should retract it about 4 inches prior to towing the rake any farther. This assists the ability of the rake to withstand unexpected shock loads, rough terrain, etc.

Repeat the following sequence until an acceptable setting is accomplished.

- ↳ Read the system pressure as per the method in Step 5, above.
- ↳ Using the rake operator control, lower the baskets and relieve any other hydraulic pressure in the rake.
- ↳ Shut off the tractor.
- ↳ Go to the relief valve, loosen the locking nut, and rotate 1 turn.
- ↳ Usually, clockwise = increase pressure setting
counter clockwise = decrease pressure setting.
- ↳ Re-tighten the locknut.
- ↳ Start the tractor. Read the system pressure as per Step 5.

MAINTENANCE

8803 RAKE

MAINTENANCE BASKET RAKE



CAUTION

Read all SAFETY MESSAGES at the beginning of this manual before attempting any of the procedures described in this section.

Regard especially the following:

BEFORE APPROACHING OR ENTERING ANY MECHANISM TO SERVICE, INSPECT, OR MAKE ADJUSTMENTS:

- A. LOWER UNIT TO THE GROUND.
- B. SHUT THE TRACTOR OFF.
- C. LOCK THE TRACTOR'S PARKING BRAKE.
- D. REMOVE THE KEY.

STAND CLEAR

Look around to be sure that if something slipped or accidentally moved that no harm would occur.

Personnel operating and working with machinery must not wear loose, dangling or unbuttoned clothing that could tangle in machinery.



WARNING: AVOID HIGH-PRESSURE FLUIDS

1. Escaping fluid under pressure can penetrate the skin causing serious injury.
2. Shut off tractor before connecting or disconnecting hydraulic lines at tractor.
3. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hand and body away from pinholes and components that may eject fluids under pressure. Use a piece of cardboard to search for leaks.
4. If ANY fluid is injected into the skin, a doctor familiar with this type of injury must be surgically removed immediately.

BASKET RAKE



WARNING **CAUTION**

Read all safety messages on previous page before attempting any of these procedures.

Stripper Bar Alignment

Keep the stripper bar ribs aligned to prevent contact with the tines at any point as the basket revolves. There should be a minimum of ½" clearance at all times. See Fig. 19.

- 1) To align ribs for clearance, use either a hickey or pipe wrench as illustrated to re-position the stripper bar.



"HICKEY BAR"

Fig. 19

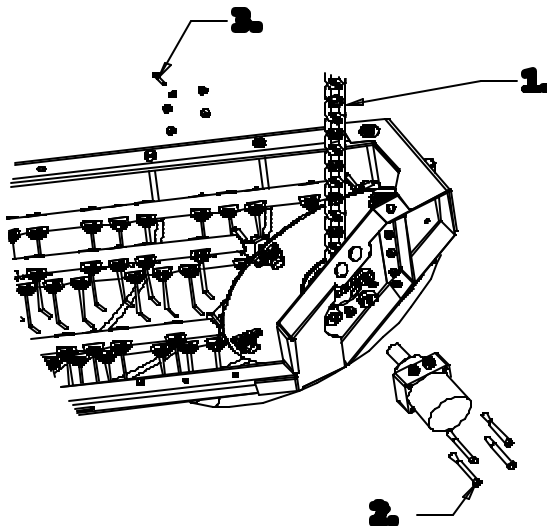


Fig. 20

HYDRAULIC ORBITAL MOTOR REMOVAL

To replace the orbital motor follow this procedure

- 1) Support the basket by wrapping a chain around the tine bar and securing it to the frame, see Fig. 20, Item 1.
- 2) Remove the four motor mounting bolts see, Fig. 20, Item 2.
- 3) Remove the center motor shaft bolt, see Fig. 20, Item 3.
- 4) With a port-a-press, press the motor shaft out of the hub.
- 5) To install the orbital motor, reverse the process.

MAINTENANCE BASKET RAKE



CAUTION

Read all SAFETY MESSAGES at the beginning of this manual before attempting any of the procedures described in this section.

Regard especially the following:

BEFORE APPROACHING OR ENTERING ANY MECHANISM TO SERVICE, INSPECT, OR MAKE ADJUSTMENTS:

- A. LOWER UNIT TO THE GROUND.
- B. SHUT THE TRACTOR OFF.
- C. LOCK THE TRACTOR'S PARKING BRAKE.
- D. REMOVE THE KEY.

STAND CLEAR

Look around to be sure that if something slipped or accidentally moved that no harm would occur.

Personnel operating and working with machinery must not wear loose, dangling or unbuttoned clothing that could tangle in machinery.



WARNING: AVOID HIGH-PRESSURE FLUIDS

1. Escaping fluid under pressure can penetrate the skin causing serious injury.
2. Shut off tractor before connecting or disconnecting hydraulic lines at tractor.
3. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hand and body away from pinholes and components that may eject fluids under pressure. Use a piece of cardboard to search for leaks.
4. If ANY fluid is injected into the skin, a doctor familiar with this type of injury must be surgically removed immediately.

MAINTENANCE BASKET RAKE



CAUTION

Read all SAFETY MESSAGES at the beginning of this manual before attempting any of the procedures described in this section.

Regard especially the following:

BEFORE APPROACHING OR ENTERING ANY MECHANISM TO SERVICE, INSPECT, OR MAKE ADJUSTMENTS:

- A. LOWER UNIT TO THE GROUND.
- B. SHUT THE TRACTOR OFF.
- C. LOCK THE TRACTOR'S PARKING BRAKE.
- D. REMOVE THE KEY.

STAND CLEAR

Look around to be sure that if something slipped or accidentally moved that no harm would occur.

Personnel operating and working with machinery must not wear loose, dangling or unbuttoned clothing that could tangle in machinery.



WARNING: AVOID HIGH-PRESSURE FLUIDS

1. Escaping fluid under pressure can penetrate the skin causing serious injury.
2. Shut off tractor before connecting or disconnecting hydraulic lines at tractor.
3. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hand and body away from pinholes and components that may eject fluids under pressure. Use a piece of cardboard to search for leaks.
4. If ANY fluid is injected into the skin, a doctor familiar with this type of injury must surgically removed immediately.

BASKET RAKE



WARNING **CAUTION**

Read all safety messages on previous page before attempting any of these procedures.

Removal of Lift Cylinder

There are times when the removal of the lift cylinder or adjustment or components are necessary. The following procedure should be followed. See Fig. 24.

- 1) Place below the basket frame, Item 1, a jack stand or other suitable blocking means.
- 2) Lower the basket by turning the adjustment handle, Item 2, until the basket frame is resting on the jack stand and all tension has been removed from the lift cylinders.
- 3) Remove hydraulics hose, (not shown), from lift cylinder.
- 4) Remove cotter key on cylinder pin and then remove the pin. The cylinder is now free on the bottom.
- 5) Remove cylinder pin from cylinder rod on top and bottom.
- 6) Cylinder should now be free and replacement of the parts made.
- 7) Reverse process for installation.

ADJUSTMENT HANDLE, ITEM #2



Fig. 24

ADJUSTMENT HANDLE, ITEM #2

MAINTENANCE BASKET RAKE



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- D. REMOVE THE KEY.

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WARNING: AVOID HIGH-PRESSURE FLUIDS

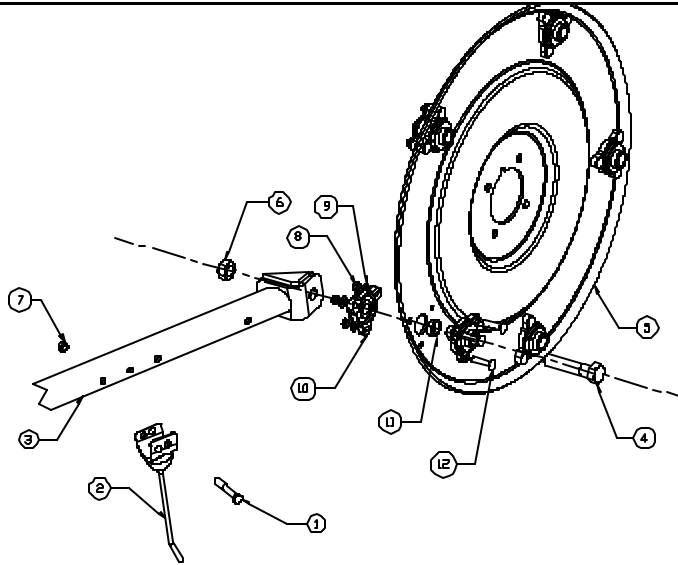
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4. If ANY fluid is injected into the skin, a doctor familiar with this type of injury must be surgically removed immediately.

BASKET RAKE



WARNING **CAUTION**

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Removal and Installation of Tines

The rakes tines are mounted individually so that they can be replaced easily without removing the tine bar or discarding a pair of teeth, see Fig 25.

- 1) Shorten the replacement tine to the length of the other tines on the bar.
- 2) Remove $3/8'' \times 2 \ 1/2''$ bolt, Item 1, that connects the tine, Item 2, to the tine bar, Item 3.
- 3) Attach new tine to tine bar. Caution should be used to make sure new tines are replaced in the same sequence and pattern as the other tines.
- 4) When installing any rubber-mounted tine, pull tines into saddle before tightening the mounting belt.
- 5) The tines should be checked and straightened periodically to keep them from contacting the stripper bars and contributing to failures.
- 6) Tighten the tine mounting bolts to 20 ft. lb. of torque.
- 7) Follow same procedure for installation of optional multi tines.

Tine Bar Replacement

The tine bar has been designed to make changing or replacing it very easy. Refer to Fig. 25.

- 1) Remove tines, Item 2, from tine bar, Item 3.
- 2) Remove $3/4'' \times 4''$ long bearing bolt, Item 4 that fastens the tine bar to the disc Item 5.
- 3) Remove tine bar from the disc.
- 4) Reverse the process to install.

Bearing Replacement

- 1) Remove Item 7 & 6 from Item 4.
- 2) Remove Item 9 & 10 from Item 11. (Typical in three locations per bearing.)
- 3) Remove bad bearing and position new bearing.
- 4) Place Item 11 in place and position Item 9 and 10 back in place.
- 5) Position Item 4 through bearing.
- 6) Place tine bar back against bearing and add Item 6 and 7.
- 7) Securely tighten Item 7 on Item 4.

MAINTENANCE BASKET RAKE



CAUTION

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- C. LOCK THE TRACTOR'S PARKING BRAKE.
- D. REMOVE THE KEY.

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Personnel operating and working with machinery must not wear loose, dangling or unbuttoned clothing that could tangle in machinery.



WARNING: AVOID HIGH-PRESSURE FLUIDS

1. Escaping fluid under pressure can penetrate the skin causing serious injury.
2. Shut off tractor before connecting or disconnecting hydraulic lines at tractor.
3. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hand and body away from pinholes and components that may eject fluids under pressure. Use a piece of cardboard to search for leaks.
4. If ANY fluid is injected into the skin, a doctor familiar with this type of injury must be surgically removed immediately.

BASKET RAKE



WARNING
CAUTION

Read all safety messages on previous page before attempting any of these procedures.

Swing Arm Bushing Replacement

Remove basket from swing arm.

Remove swing cylinder and mounting bracket.

Raise upper axle off of swing arm #2.

Replace bronze bushings, part number (94-1016-88) in swing arm #2 as needed

Reverse above for installation.

See Fig. 26

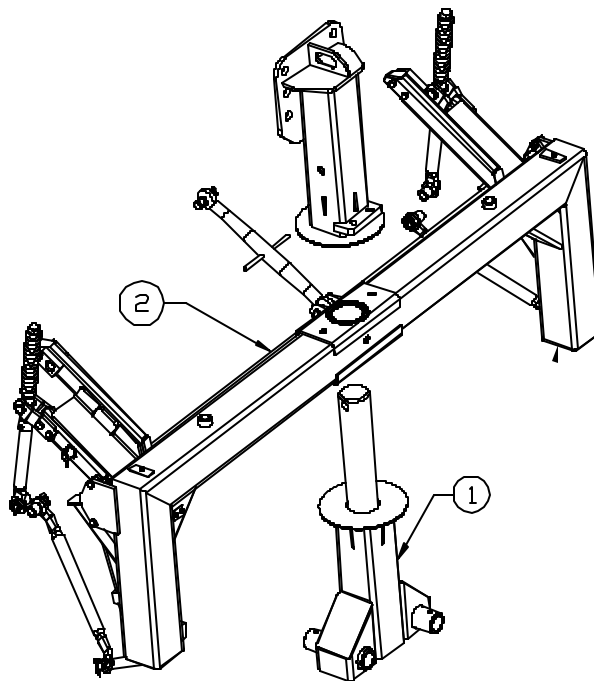


Fig. 26

MAINTENANCE BASKET RAKE



CAUTION

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BASKET RAKE



WARNING **CAUTION**

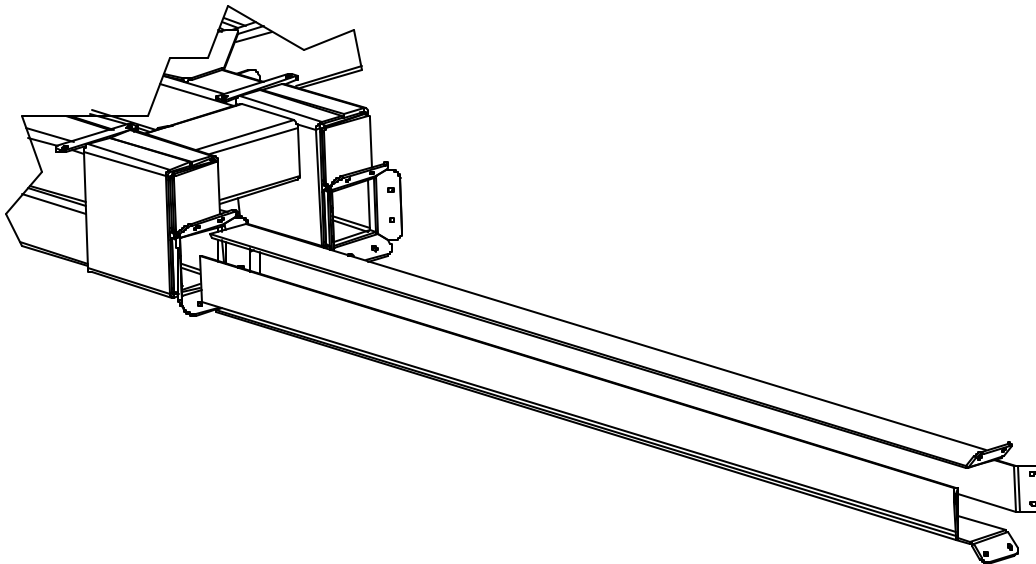
Read all safety messages on previous page before attempting any of these procedures.



WARNING **CAUTION**

When replacing poly slide bearings and shims, always do repair to one side at a time.

- 1) Elevate main frame off of the ground or surface with a hydraulic jack from underneath or use some type of lifting system such as a chain hoist or crane from overhead.
- 2) After raising frame, extend extension arm out until it is fully extended and detach the upper hose rack from the extension arm.
- 3) At this time detach the extension cylinder from the extension arm.
- 4) Once the extension arm is fully extended, secure the extension arm to prevent the arm from falling. Use an overhead crane or a forklift from underneath to support extension arm.
- 5) Determine which bearing needs to be replaced. Once they have been determined, remove the (2) 3/8"–16 x 1" hex bolts from the poly.
- 6) After removing bolts, slide the poly out of the main frame.
- 7) After removing the worn poly, position new poly slide back in place and anchor back in place.
- 8) Push extension arm back into mainframe to line up hole to reconnect the extension arm cylinder.
- 9) Remove apparatus holding extension arm, and then retract extension while watching the upper hose rack closely to prevent any binding or interference with hydraulic hoses.
- 10) When the arm is fully retracted, bolt the hose rack back in place.
- 11) Now repeat the same steps to do opposite side of the rake.
- 12) After completion, lower main frame back down where it supported by the extension arms only.



MAINTENANCE BASKET RAKE



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WARNING: AVOID HIGH-PRESSURE FLUIDS

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BASKET RAKE



WARNING
CAUTION

Read all safety messages on previous page before attempting any of these procedures.

Spindle Replacement Instructions

- 1) Remove hub, Item 1, and bearings, Item 2. See Fig. 28
- 2) Remove spindle bolt, Item 3.
- 3) Remove spindle.
- 4) Replace spindle bolt, bearing, and hub.

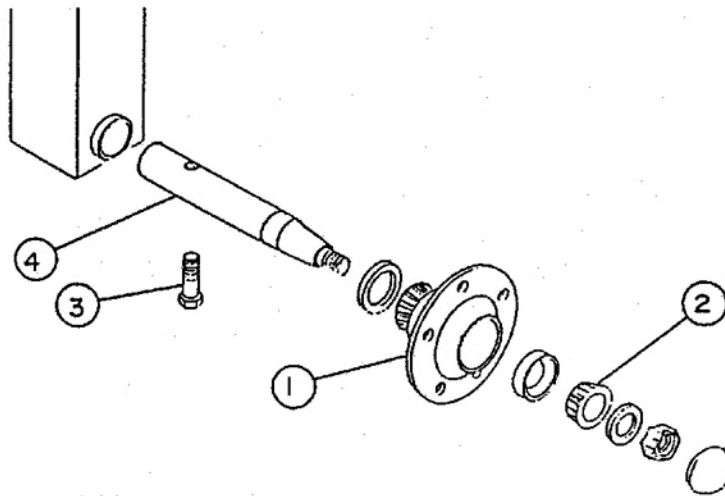


Fig. 28

MAINTENANCE BASKET RAKE



CAUTION

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4. If ANY fluid is injected into the skin, a doctor familiar with this type of injury must be surgically remove it immediately.

BASKET RAKE



WARNING **CAUTION**

Read all safety messages on previous page before attempting any of these procedures.

Electronic Control Box

- 1) If the control box, Item 1, is completely non-functional, check the fuse inside the control box. If the fuse is satisfactory, check the condition of the 12V battery source.
- 2) Electric Switches, Items 2,3,4,5,6
If only one function is non-operable, this could indicate a faulty switch. Or again, there could be a failure in the electrical cable.
- 3) The manual flow control, controls basket RPM – not to exceed 90 RPM.

95% OF MALFUNCTIONS ARE DUE TO INFREQUENT REPLACEMENT OF THE HYDRAULIC FILTER.

NOTE: RAKE MUST BE HITCHED TO TRACTOR TO HAVE A GROUND CONNECTION



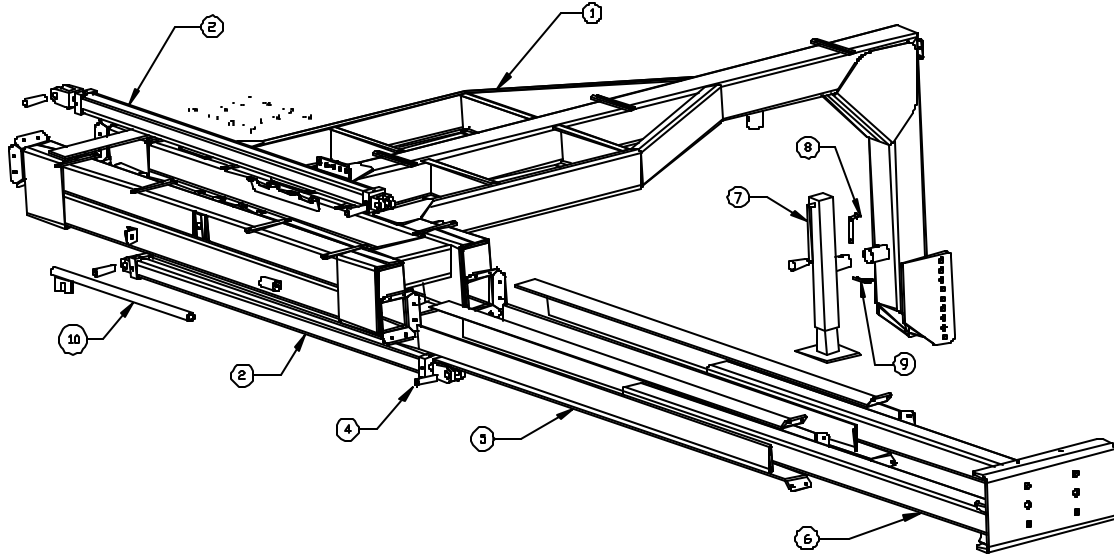
BASKET RAKE TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
Tine bar breaking in half	1. Basket running too fast.	1. Slow basket speed down so that it does not exceed 90 RPM
Front basket idler spindle breaking.	1. Basket height set too low, tines are digging into the ground 2. Basket running too fast	1. Adjust basket height so that tines do not touch the ground. Tines shoe be within 1/2" of the ground, but not actually in contact with the ground. 2. Slow basket speed down so that is does not exceed 90 RPM.
Disc wheels idler spindle breaking	1. Loose tine bar head bolts. 2. Tine bar head bearing. 3. Basket speed too fast.	1. Tighten tine bar head bolts. 2. Replace tine bar head bearing. 3. Slow basket speed down so that it does not exceed 90 RPM.
Baskets fail to operate when hydraulic remote valve is opened.	1. Check valve #79-211-88 in in the open position.	1. Replace hub, using new bolt, lock washer, and flat washer. 2. Remove and clean flow control valve or replace the valve with a new one.
Baskets rise during field operation.	1. System back pressure is excessive, because return oil flow is restricted.	Read the HYDRAULICS section of OWNER'S MANUAL.
Rake function fails to operate.	1. Manual control cable out of adjustment. 2. Wire came off solenoid adjustment. (Electric control valve only) 3. Solenoid defective. (Electric control valve only) 4. Hydraulic motor or cylinder is bypassing hydraulic oil internally.	1. Adjust cable to take up slack. 2. Replace wire and tighten spade connector. 3. Replace solenoid. 4. Install new seal kit in defective part.

8803 RAKE PARTS MANUAL

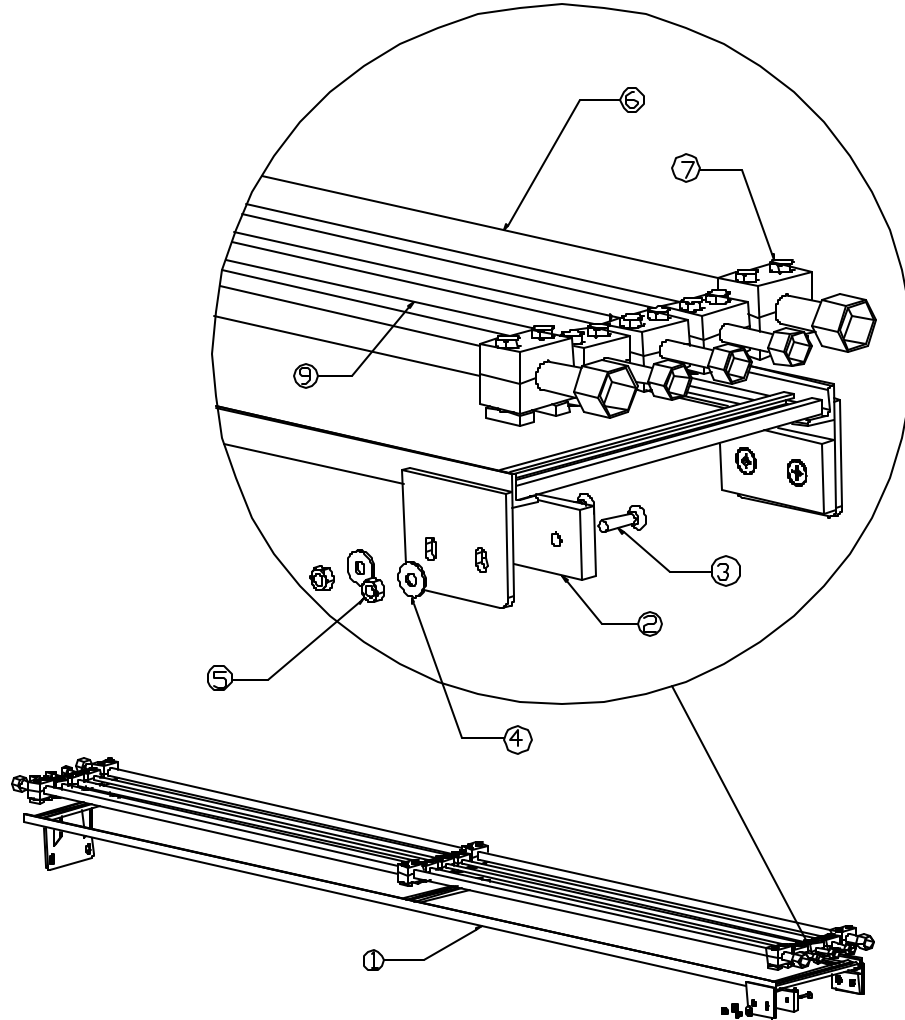
<i>Main Frame</i>	90-92
<i>Extension Arm</i>	93-94
<i>Basket Adaptor, Pivot Arm, and Swing Arm</i>	95-96
<i>Basket Rake Basket Drive End</i>	97-98
<i>Basket Rake Basket Idler End</i>	99
<i>Guard and Stripper Bar Detail</i>	100
<i>Extension Arm Cylinder</i>	101
<i>Lift Cylinder</i>	102
<i>Swing Cylinder</i>	103
<i>Hydraulic Schematic</i>	104
<i>Fasse Valve Hydraulic/Electrical System</i>	105-110

MAIN FRAME 8803 RAKE



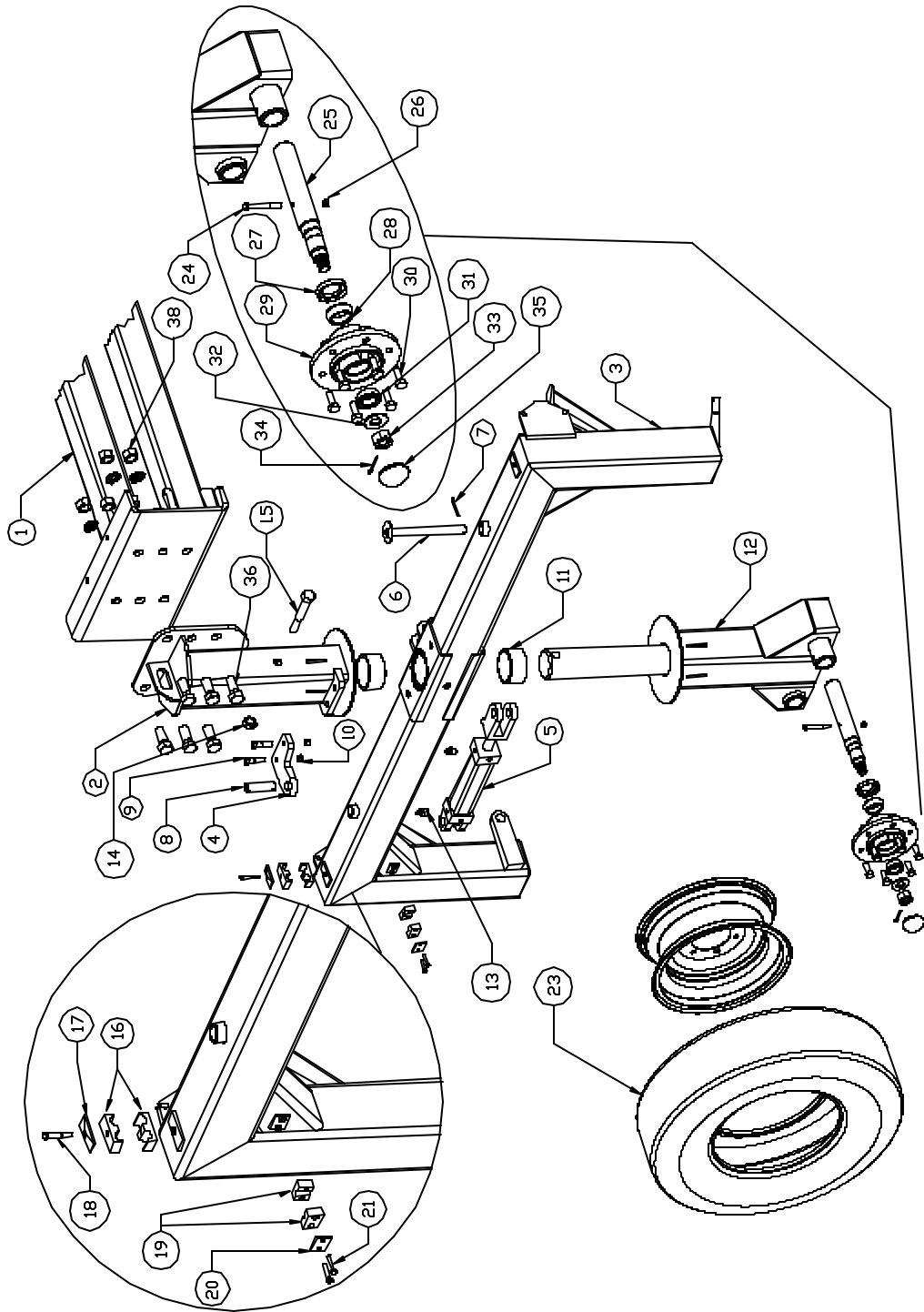
ITEM NO.	DESCRIPTION	PART NO.	QUANTITY
1	WELDMENT, 8803 MAIN FRAME	85-4000-88	1
2	CYLINDER, 2-1/2" DIA. X 70" STROKE	79-1023-88	2
4	PIN, CLEVIS (WITH 2 COTTER PINS)	77-003-85	4
5	POLY, EXTENSION ARM SLIDE	68-0001-86	16
6	WELDMENT, 8803 EXTENSION ARM	85-1064-88	2
7	WELDMENT, RAKE JACK	85-1030-88	1
8	PIN, 5/8" X 3" BENT ARM	128007	1
9	PIN, #12, 3/16" X 3-1/2" HAIR	126004	1
10	WELDMENT, HICKEY BAR	85-014-85	1
NOT SHOWN	HYDRAULIC TUBE, 1/2"x 60", 8FP x 8FP	79-1102-88	1
NOT SHOWN	HYDRAULIC TUBE, 1/2"x 100", 8FP x 8FP	79-1100-88	1
NOT SHOWN	HYDRAULIC TUBE, 1/2" x 104", 8FP x 8FP	79-1110-88	1
	POLY SLIDE BEARING FASTENERS		
NOT SHOWN	WASHER, 3/8" SAE FLAT	4402-1200	32
NOT SHOWN	BOLT, 3/8" X 1" GRADE 5 HEX	2816-1210	32
NOT SHOWN	NUT, 3/8" UNC STOVER HEX	1412-1200	32

TOP HOSE RACK 8803 RAKE



ITEM NO.	DESCRIPTION	PART NO.	QUANTITY
1	WELDMENT, HOSE TOP RACK	85-1074-88	1
2	BEARING, HOSE TOP RACK POLY	68-1002-88	2
3	SCREW, 1/4" X 1" FLAT MACHINE HEAD	4216-0810	4
4	WASHER, 1/4" TYPE A WIDE FLAT	1702-0800	4
5	NUT, 1/4" HEX KEP	4112-0800	4
6	ASSEMBLY, 1/2" X 82" LONG HYDRAULIC TUBE, 8FP x 8FP	79-1101-88	4
9	ASSEMBLY, 3/8" X 82" LONG HYDRAULIC TUBE, 6FP x 6FP	79-1103-88	6
NS	CLAMP, TUBE RACK, HYDRAULIC TUBES	68-3004-88	12
N/S	CLAMP, BOTTOM HOSE CLAMP	68-3006-88	4
N/S	CLAMP, TONGUE HYDRAULIC TUBES	68-4000-88	6

RIGHT/LEFT HAND EXTENSION ARM 8803 RAKE



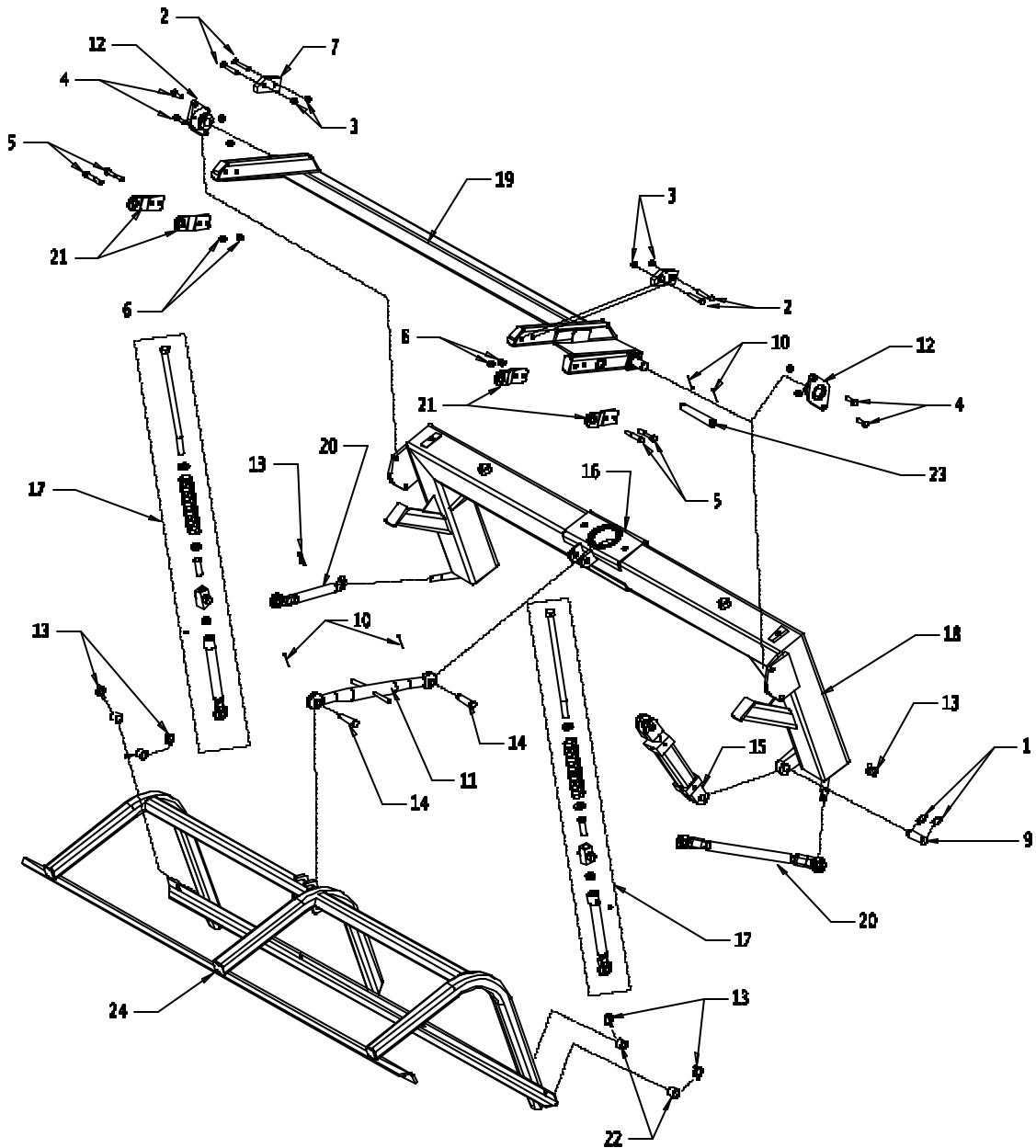
RIGHT/LEFT HAND EXTENSION ARM

8803 RAKE

Quantities are for both left and right hand arms

ITEM NO.	DESCRIPTION	PART NO.	QUANTITY
1	WELDMENT, 8803 EXTENSION ARM	85-1064-88	2
2	WELDMENT, 8803 UPPER AXLE TUBE	85-1073-88	2
3	WELDMENT, 8803 SWING ARM	85-1028-88	2
4	PLATE, SWING ARM CYLINDER LUG	93-1090-88	2
NOT SHOWN	BUSHING, HARDENED CONNEX	79-190-88	4
5	CYLINDER, 2" DIA. X 8" STROKE ASAE	79-158-88	2
6	WELDMENT, SWING ARM CYLINDER PIN	85-1032-88	2
7	PIN, 3/16" X 2" LONG COTTER	77-015-04	2
8	PIN, CLEVIS (WITH 2 COTTER PINS)	77-003-85	2
9	BOLT, 1/2" X 2" LONG GRADE 5 HEX	2816-1620	4
10	NUT, 1/2" STOVER HEX	1412-1600	4
11	BUSHING, SWING ARM BRONZE	94-1016-88	4
12	WELDMENT, R.H. LOWER AXLE	85-1070-88	1
12	WELDMENT, L.H. LOWER AXLE (NOT SHOWN)	85-1071-88	1
13	ADAPTER - #6MP-#6MJ W/ 1/16" ORIFICE STRAIGHT	79-003-32	4
14	NUT, 7/8" STOVER HEX	1412-2800	2
15	BOLT, 7/8" DIA. X 6" LONG GRADE 5 HEX	2816-2860	2
16	CLAMP, 1/2" HOSE	79-034-88	4
17	PLATE, CLAMP TOP COVER	77-037-38	2
19	CLAMP, 3/8" HOSE	77-111-88	4
20	PLATE, CLAMP COVER	123011	2
21	BOLT, 1/4" x 1.5" HEX	2816-0814	4
23	TIRE, 8.5/9-15K, SMOOTH. WHEEL, 15 X 6LB, 6-6-4.62, 1.25+	84-015-88	4
24	BOLT, 3/8" X 3" GRADE 5 HEX	2816-1230	4
25	ROUND, SPINDLE, Q888 HUB	96-034-88	4
26	NUT, 3/8" STOVER HEX	1412-1200	4
27	SEAL, Q888 HUB GREASE	77-006-02	4
28	BEARING, Q888 HUB INNER	77-007-02	4
29	HUB, Q888, 6 BOLT (WITH RACE)	77-001-02	4
30	BOLT, 1/2"-20 X 1-1/4" LONG LUG	77-013-02	24
31	BEARING, Q888 HUB OUTER	77-008-02	4
32	WASHER, Q888 HUB SPINDLE	77-005-02	4
33	NUT, 7/8" CASTLE (CNQ888)	77-004-02	4
34	PIN, 5/32" X 1-3/4" LONG COTTER	77-011-02	4
35	CAP, Q888 HUB DUST	77-012-02	4
36	BOLT, 1" X 2-1/2" LONG GRADE 8 HEX	2818-3224	12
38	NUT, 1"-8 STOVER LOCK	1412-3200	12

BASKET ADAPTOR, PIVOT ARM, AND SWING ARM 8803 RAKE

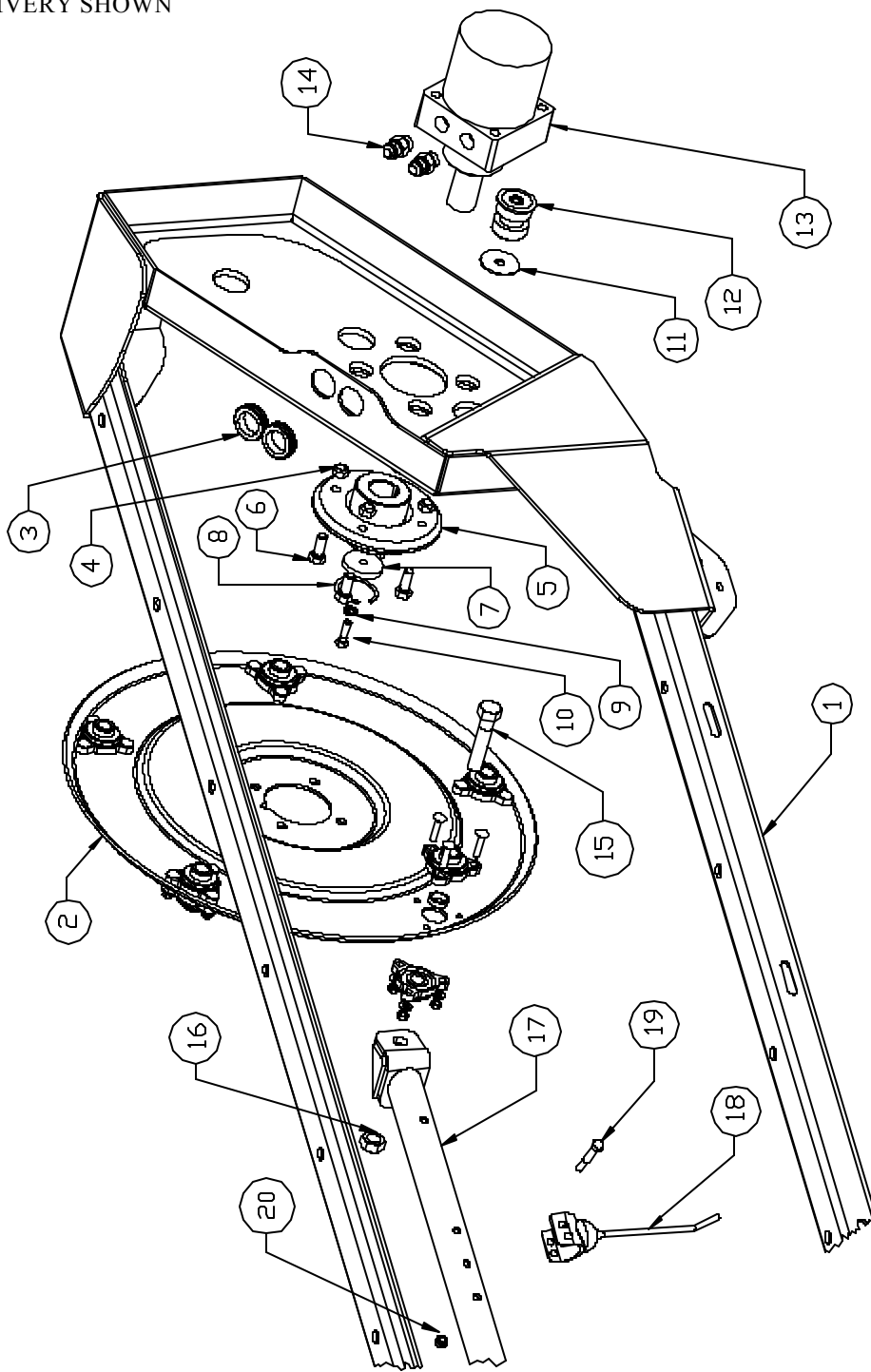


**BASKET ADAPTOR, PIVOT ARM, AND SWING ARM
8803 RAKE**

ITEM NO.	DESCRIPTION	PART NO.	QUANTITY
1 & 9	PIN, CLEVIS (WITH 2 COTTER PINS)	77-003-85	1
2	BOLT, 7/16" X 3" #3 PLOW	0315-1430	4
3	NUT, 7/16" HEX	812-1400	4
4	BOLT, 1/2" X 1-1/2" GRADE 5 HEX	2816-1614	4
5	BOLT, 1/2" X 3" GRADE 5 HEX	2816-1630	4
6	NUT, 1/2" HEX KEP	4112-1600	8
7	POLY, PIVOT ARM/BASKET BUMPER R.H. L.H.	68-1008-88	4
10	PIN, 3/16" X 2" LONG COTTER	77-015-04	4
11	TOP LINK, CAT. 1	79-022-88	1
12	BEARING, 2 HOLE	79-025-88	2
13	PIN, 7/16" DIA. LYNCH	79-061-36	12
14	PIN, 3/4" DIA. X 3" CLEVIS	79-081-88	2
15	CYLINDER, 2" DIA. X 6"	79-1006-88	1
16	FITTING, 5/16" DRIVE IN GREASE	79-6441-40	1
17	ASSEMBLY, GROUND PRESSURE ADJUSTING ARM		4
	WELDMENT, ADJUSTING ARM, GROUND PRESSURE	85-138-88	4
	NUT, 3/4" HEX JAM	1014-2400	4
	GREASE FITTING, 5/16-DRIVE IN	79-6441-40	4
	BUSHING, UHMW BOLT GUIDE	77-066-88	4
	WASHER, 3/4" FLAT	79-126-88	8
	SPRING,	79-204-88	4
	BOLT, 3/4" X 17" GRADE 5 HEX	2816-24170	4
	TRUNNION, BOLT GUIDE	79-1020-88	4
18	WELDMENT, 8802 SWING ARM	85-1028-88	1
19	WELDMENT, BASKET RAKE PIVOT ARM	85-1031-88	1
20	WELDMENT, BASKET STAND OFF	85-128-88	2
21	PLATE, GROUND PRESSURE ADJUSTING ARM MOUNTS	93-1099-88	4
23	PIN, CYLINDER CLEVIS	96-015-88	1
24	ADAPTOR, 11'-6" PHYSICAL RH BASKET	85-1056-88	1
	ADAPTOR, 11'-6" PHYSICAL LH BASKET	85-1057-88	1

TYPICAL BASKET DRIVE END 8803 RAKE

RH DELIVERY SHOWN

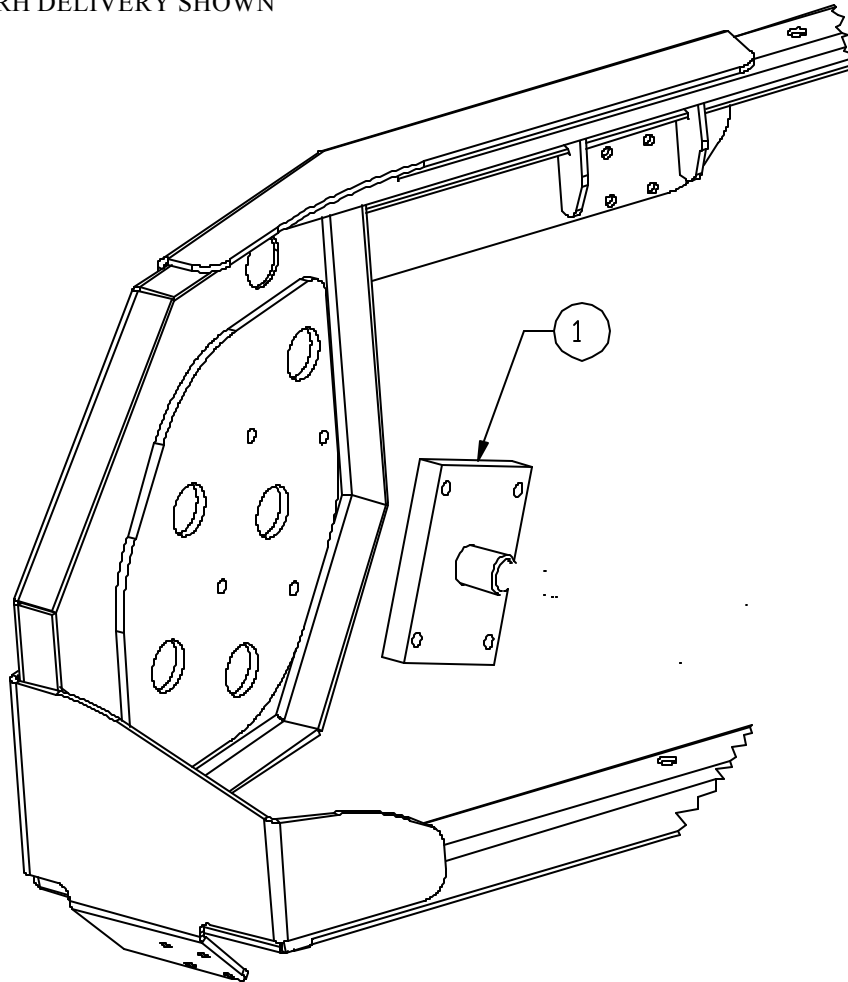


TYPICAL BASKET DRIVE END 8803 RAKE

ITEM NO.	DESCRIPTION	PART NO.	QUANTITY
1	WELDMENT, 11'-6" RH DELIVERY BASKET FRAME	85-9001-88	1
	WELDMENT, 11'-6" LH DELIVERY BASKET FRAME	85-9000-88	1
2	ASSEMBLY, BASKET RAKE DISC/BEARING		2/4
	BEARING, VF3S-112M 3 BOLT	101-300-012C	10/40
	BUSHING, FORMED DISC BEARING SPACER	94-021-88	5/20
	DISC, BASKET RAKE FORMED	93-1119-88	2/4
	BOLT, 5/16" X 1-1/2" GRADE 8 HEX HEAD	2816-1014	15/60
	NUT, 5/16" STOVER HEX	1412-1000	15/60
	WASHER, 5/16" LOCK	1602-1000	15/60
4	NUT, 1/2" UNF STOVER HEX	1432-1600	8
5	WELDMENT, 1-1/2" SHAFT HUB (FULLY MACHINED)	85-1012-97	1
6	BOLT, 1/2"-20 UNF X 1-1/4" GR. 5 HEX	2836-1612	8
7	SPACER, HUB	96-001-97	1
8	SNAP RING, INTERNAL RETAINING	127003	1
9	WASHER, 3/8" REGULAR LOCK	1602-1200	1
10	BOLT, 3/8" X 1-1/4" LONG HEX	2816-1212	1
11	WASHER, EXTRA WIDE ISOLATOR	77-1025-88	4
12	ISOLATOR, MOTOR	79-1015-88	4
	SEAL KIT, MOTOR	72-061-88	2
13	MOTOR, RE24674100 HYDRAULIC	79-005-97	1
14	ADAPTOR, #10MORB—#8MJ	77-070-06	2/4
15	BOLT, 3/4" X 3-1/2" LONG GRADE 5 HEX	2816-2434	5/20
16	NUT, 3/4" GRADE 5 STOVER	1412-2400	5/20
17	WELDMENT, 11'-6" TINE BAR	85-1044-88	5/10
18	TINE, RH/LH, UNIVERSAL	79-1021-88	120/175
19	BOLT, 3/8" X 2-1/2" LONG GR. 5 HEX (FULL / STANDARD TINES)	2816-1224	120/175
20	NUT, 3/8" STOVER HEX (FULL / STANDARD TINES)	1412-1200	120/175
NOT SHOWN	BOLT, 1/2" X 4-1/2" LONG GRADE 5 HEX (MOTOR BOLT)	2816-1644	4/8
NOT SHOWN	NUT, 1/2" STOVER HEX (MOTOR/IDLER MOUNT NUT)	1412-1600	8

TYPICAL BASKET IDLER END 8803 RAKE

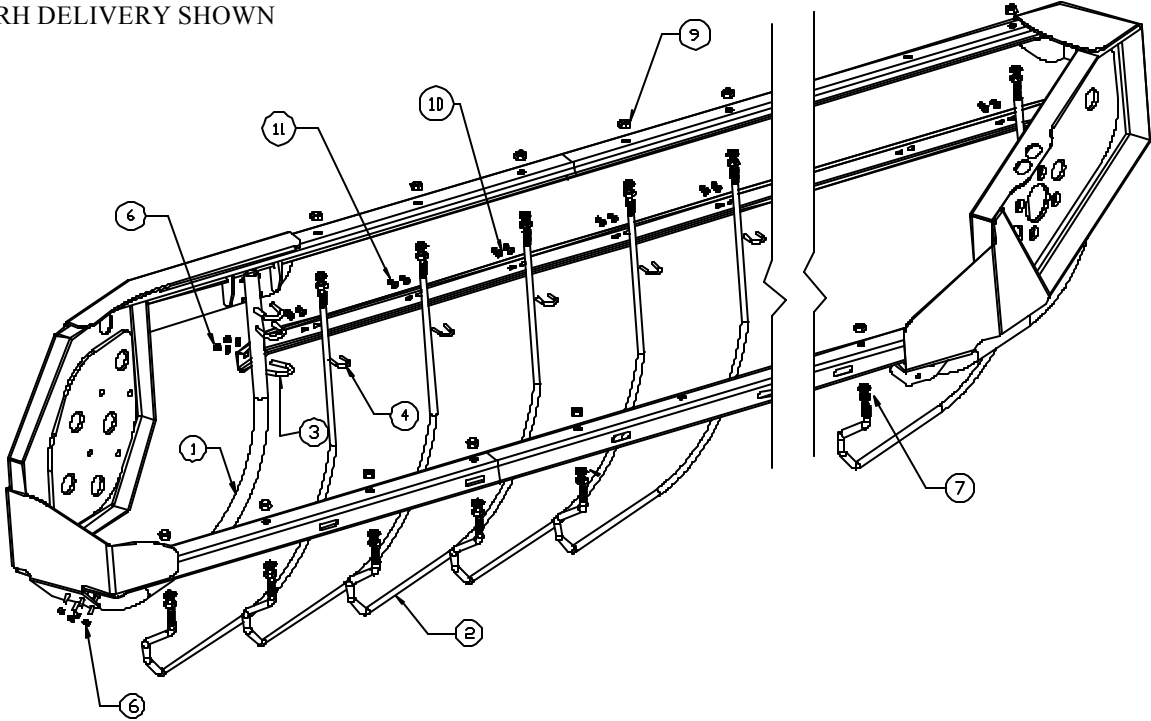
RH DELIVERY SHOWN



ITEM NO.	DESCRIPTION	PART NO.	QUANTITY
1	WELDMENT, BASKET IDLER SHAFT	85-9005-88MOD	2
N/S	BEARING, 4-BOLT, IDLER	101-111-108B	4

GUARD AND STRIPPER BAR DETAIL 8803 RAKE

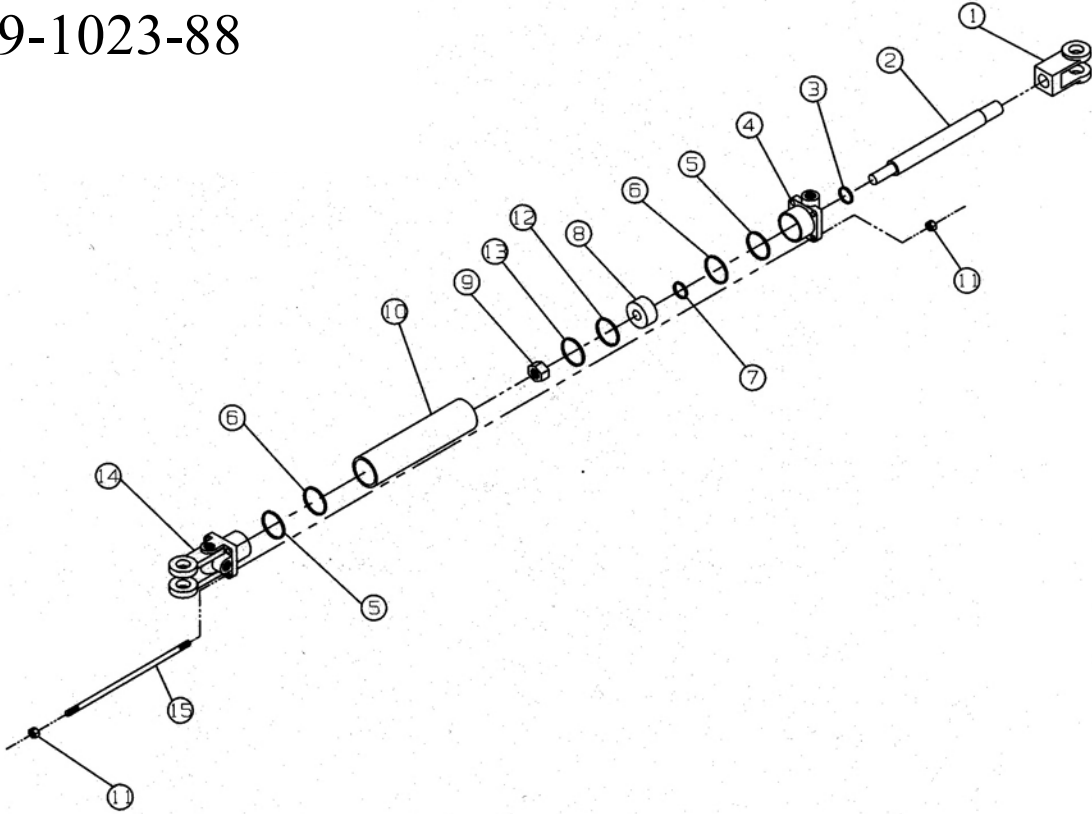
RH DELIVERY SHOWN



ITEM NO.	DESCRIPTION	PART NO.	QUANTITY
1	GUARD, REAR/FRONT BASKET	92-1000-88	2/4
2	BAR, PHYSICAL LH., R.H. DELIVERY STRIPPER	96-1007-88	12
	BAR, PHYSICAL RH., L.H. DELIVERY STRIPPER BAR	96-1008-88	12
3	U-BOLT, 3/8 X 1-3/8 X 2-7/16	79-1018-88	10
4	U-BOLT, 1/4 X 1 X 1-3/4	79-077-88	12
6	NUT - 3/8-16 UNC PLATED SERRATED FLANGE	3916-1200	16/32
7	NUT, 5/8 JAM HEX	1012-2000	24/22
9	NUT - 5/8-11 UNC PLATED FLANGED TOP-LOCK	3912-2000L	24/48
11	NUT - 1/4-20 UNC PLATED SERRATED FLANGE	3916-0800	24/48

**EXTENSION ARM CYLINDER
8803 RAKE**

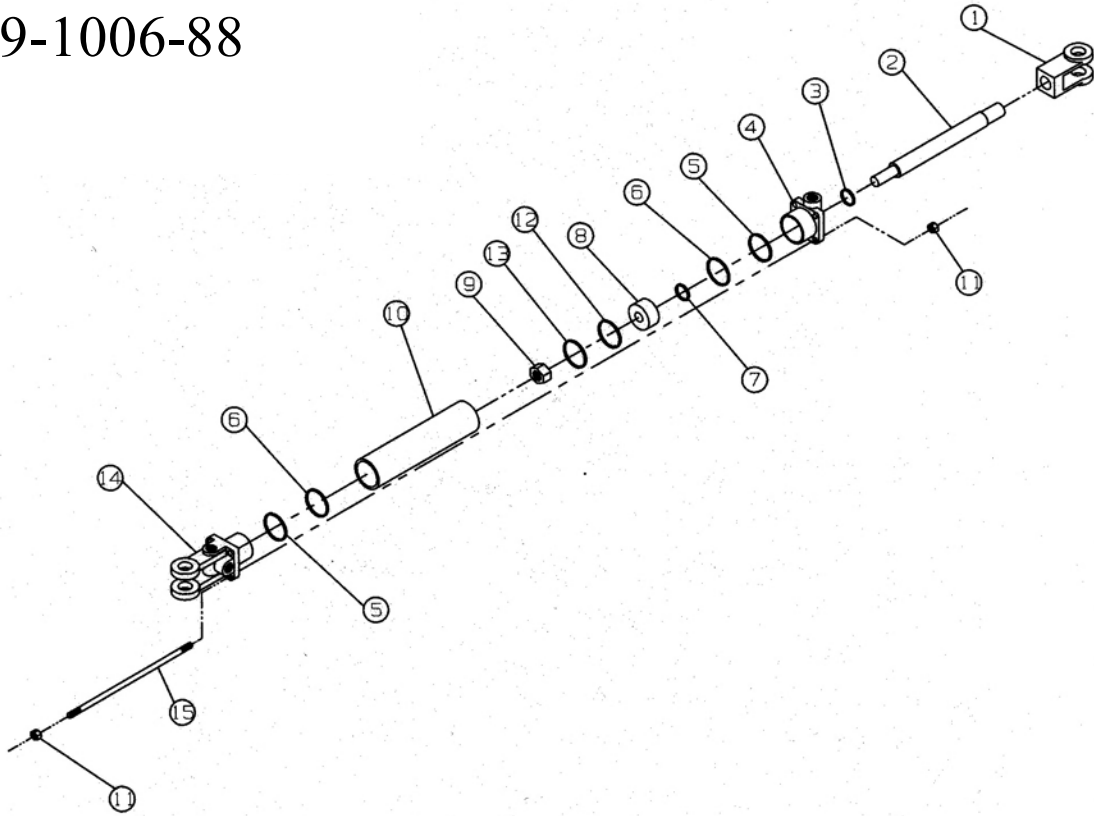
79-1023-88



ITEM NO.	DESCRIPTION	PART NO.	QUANTITY
1	CYLINDER, MAIN EXTENSION, 2.5" x 70"	79-1023-88	2
N/S	SEAL KIT	79-1048-88	2

LIFT CYLINDER 8803 RAKE

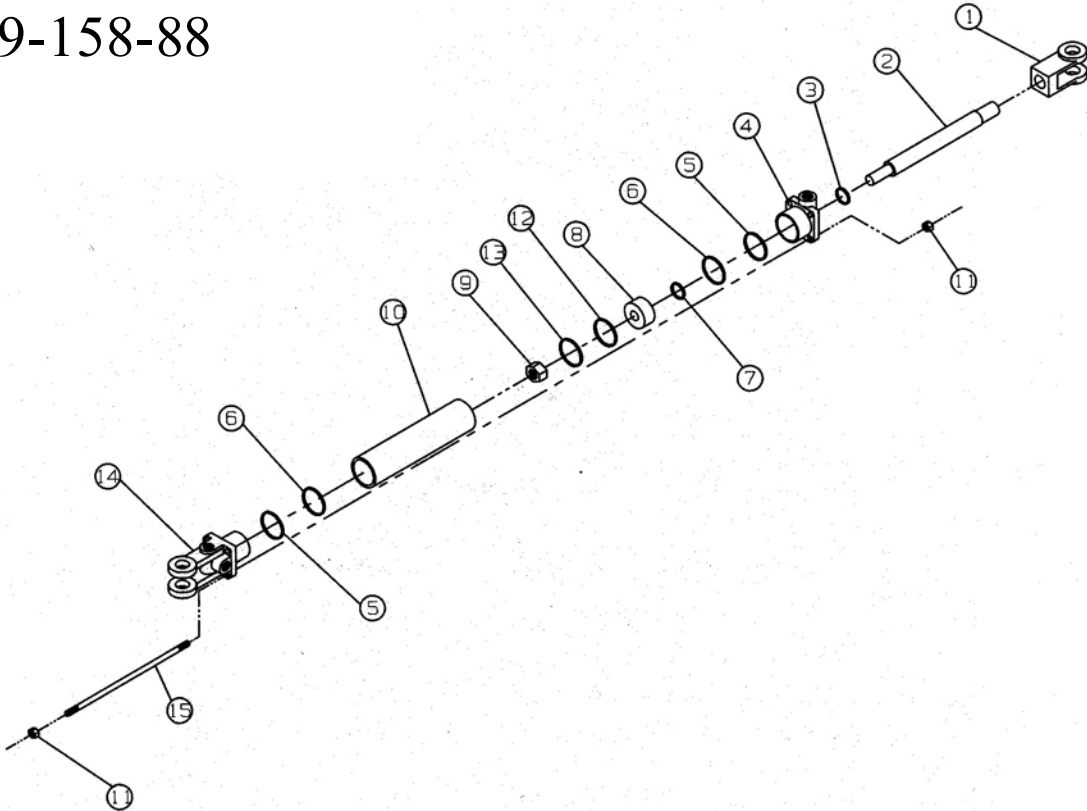
79-1006-88



ITEM NO.	DESCRIPTION	PART NO.	QUANTITY
1	CYLINDER, BASKET LIFT, 2" x 6"	79-1006-88	2
N/S	SEAL KIT	79-670-22	2

**SWING CYLINDER
8803 RAKE**

79-158-88



ITEM NO.	DESCRIPTION	PART NO.	QUANTITY
1	CYLINDER, BASKET SWING, 2" x 8"	79-158-88	2
N/S	SEAL KIT	79-670-22	2