



BY OXBO

FF6118 & FF6120 ***FLEX-FRAME*** ***RAKES***



WARNING

READ AND UNDERSTAND THIS MANUAL BEFORE OPERATING THIS EQUIPMENT. UNSAFE OPERATION OR MAINTENANCE OF THIS EQUIPMENT CAN RESULT IN SERIOUS INJURY OR DEATH.

FF6118 Starting Ser# 521FF18001
FF6120 Starting Ser# 321FF20008

Part #60553

Rev. #04

HSMFG040425

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STRONG HERITAGE - STRONG PEOPLE - STRONGER FUTURE

CONTENTS

H&S Warranty	1
Manufacturer's Statement	2
Warranty Registration Form	3
Dealer Pre-Delivery Checklist	5
Dealer Delivery Checklist	7
Safety Information - Be Alert Symbol	9
Explanation of Safety Signs	10
Safety Decals	11
Safety Information - Warning - Owner Must Read and Understand	12
Cap Screw Torque Values	13
Set-Up & Assembly	14
Transporting	15
Preparing for Operation	16
Operation & Adjustments	17-18
Optional Equipment	19
Lubrication Guide	20-21
Decal Location	22-27
Troubleshooting	28
Service Notes	29-30

H&S WARRANTY

H&S Manufacturing Co., Inc. Warranty

H&S Manufacturing Co., Inc. ("H&S") warrants this product to be free from defect in material and workmanship. Except as noted below, this warranty term is twelve (12) months on parts and labor, and twenty-four (24) months on parts only from the date of delivery of the product to the original purchaser by an authorized H&S dealer. Under this warranty, H&S will repair or replace, at its option, any covered part which is found to be defective in material or workmanship during the applicable warranty term. In no case will the covered repair cost of a part or parts exceed the replacement cost of that part. In no case, unless pre-authorized by H&S, will a component be replaced versus repaired unless the cost of labor and parts exceeds 75% of the cost of a new component. Warranty repairs must be performed by H&S or a dealer authorized by H&S to sell and/or service the product involved, and will use only new or remanufactured parts or components furnished by H&S. Any warranty repairs needing to be performed by a third party must be pre-authorized by H&S. Standard freight costs will be covered by H&S for any part used to make a warrantable repair, any form of express freight will not be covered unless pre-authorized by H&S. This warranty includes approved parts and labor to repair the product but does not include, and the purchaser is responsible for, any service call and/or transportation of the product to and from the dealer's place of business, for any costs related to travel, for any premium charged for overtime labor requested by the purchaser, and for any service work not directly related to any defect covered under this warranty. This warranty includes only those components of the product manufactured by H&S. Warranty for any component not manufactured by H&S including, but not limited to, engines, batteries, tires, rims, hydraulic motors, pumps, etc. are covered by the warranty, if any, provided separately by their respective manufacturers. H&S reserves the right to request the return of any failed component.

This warranty in all its parts is extended solely to the original purchaser of the product, is terminated upon any subsequent transfer or sale from or by the original purchaser, and extends no third party benefits or rights whatsoever.

The warranty term for any product used in any for hire, rental fleet or rental application, is limited to six (6) months from the date of delivery of the product to the original purchaser by an authorized H&S dealer.

This warranty does not include: (1) Any product that has been altered or modified in ways not approved by H&S; (2) Depreciation or damage caused by normal wear, use for which the product was not designed, misuse, improper or insufficient maintenance, improper operation, accident or failure to follow the product Operator's Manual recommendations and product decal recommendations; (3) Normal maintenance parts and service; (4) Repairs made with parts other than those available from H&S or performed by anyone other than H&S or a dealer authorized by H&S to sell and/or service the product involved.

To secure warranty service the purchaser must report the product defect to a dealer authorized by H&S to sell and/or service the product involved within the applicable warranty term together with evidence of the warranty start date and make the product available to that dealer within a reasonable period of time.

For these warranty terms to be in effect the selling authorized H&S dealer and/or the customer must submit the warranty registration to H&S.

MANUFACTURER'S STATEMENT

Congratulations on your selection of an H&S product. Your new H&S product has been manufactured of the finest quality materials and components. The performance you receive from your machine is largely dependent upon how well you read, understand this manual, and apply this knowledge. There is a right and a wrong way to do everything. Please do not assume that you know how to operate and maintain your machine before reading this manual carefully. Keep this manual available for ready reference. We are very appreciative of your patronage.

H&S reserves the right to make changes or add improvements to its products at any time without incurring any obligation to make such changes to products previously manufactured. Specifications, statements and descriptions of products contained in this publication are subject to change without prior notification.

WARRANTY REGISTRATION

- Date of Purchase: _____
 - Purchaser Name: _____
 - Street Address: _____
 - City: _____
 - State: _____ Zip: _____
 - Phone Number: _____
 - E-mail Address: _____
 - Product: _____
 - Model Number: _____
 - Serial Number: _____
 - You have received the Operator's Manual for this product. Yes _____ No _____
 - Interested in receiving the H&S E-mail Newsletter? Yes _____ No _____
-
- Dealer Name: _____
 - Street Address: _____
 - City: _____
 - State: _____ Zip: _____
 - Signature: _____
- All fields must be filled out to ensure prompt notification of product and/or warranty updates.

Please mail the completed WARRANTY REGISTRATION FORM to:
H&S Manufacturing Co., Inc.
2608 S. Hume Ave.
Marshfield, WI 54449

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DEALER PRE-DELIVERY CHECKLIST

AFTER COMPLETION, DEALER SHOULD REMOVE AND RETAIN FOR RECORDS

After the rake has been completely set up, check to be certain it is in correct operating order before delivering to the customer. The following is a list of points to inspect. Check off each item as you have made the proper adjustments and found the item operating satisfactorily.

- ☐ Rake was not damaged in shipment. Check for dents and loose or missing parts. Report damage immediately to H&S Manufacturing Co., Inc.
- ☐ Rake has been correctly assembled according to instructions in this manual. Wheel nuts and all other fasteners are tightly secured.
- ☐ All bolts and fasteners are tight.
- ☐ All grease fittings have been lubricated. See Lubrication Chapter of this manual for details.
- ☐ Hoses and fittings are properly attached and there are no visible leaks.
- ☐ All mechanisms are operating trouble free.
- ☐ Rake wheels touch ground in unison when lowered into position. (Rake setting level)
- ☐ Wheels are properly mounted.
- ☐ Tires are inflated to correct pressure.
- ☐ Decals are in place and legible.

Model Number _____

Serial Number _____

Dealer's Name _____

Inspection Date _____

Signature of Pre-Delivery Inspector _____

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DEALER DELIVERY CHECKLIST

AFTER COMPLETION, DEALER SHOULD REMOVE AND RETAIN FOR RECORDS

This checklist that follows is an important reminder of valuable information that should be passed on to the customer at the time this rake is delivered.

Check off each item as you explain it to the customer.

This delivery checklist, when properly filled out and signed, assures the customer that the pre-delivery service was satisfactorily performed.

- ☐ Explain to the customer that the pre-delivery inspection was made.
- ☐ Explain to the customer all the safety precautions they must exercise when operating this unit.
- ☐ Explain raking and windrow width adjustments.
- ☐ Explain to customer that regular lubrication is required for proper operation and long life of machine.
- ☐ Show customer the lubrication section of Owner's Manual.
- ☐ Give the customer Owner's Manual and make sure they read and understand all operating and service instructions.
- ☐ Have the customer sign a completed "Warranty Registration" and mail it.

Date Delivered _____

Dealer's Name _____

By _____

Signature of Original Buyer _____

Note: Warranty is not valid until warranty card is completed and returned to H&S Mfg. Co., Inc.

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SAFETY INFORMATION



**BE
ALERT!**

**YOUR SAFETY
IS INVOLVED.**

THIS SYMBOL IS USED THROUGHOUT THIS BOOK WHENEVER YOUR PERSONAL SAFETY IS INVOLVED. TAKE TIME TO BE CAREFUL. REMEMBER: THE CAREFUL OPERATOR IS THE BEST OPERATOR. MOST ACCIDENTS ARE CAUSED BY HUMAN ERROR. CERTAIN PRECAUTIONS MUST BE OBSERVED TO PREVENT THE POSSIBILITY OF INJURY OR DAMAGE.

H&S MANUFACTURING CO., INC.

SAFETY INFORMATION

RECOGNIZE SAFETY INFORMATION

This is the safety alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.



UNDERSTAND SIGNAL WORDS

A signal word - DANGER, WARNING, or CAUTION - is used with the safety-alert symbol. DANGER identifies the most serious hazards.

Safety signs with signal word DANGER or WARNING are typically near specific hazards.

General precautions are listed on CAUTION safety signs.



WARNING



CAUTION



CAUTION

FOLLOW SAFETY INSTRUCTIONS

Carefully read all safety messages in this manual, and all safety signs on your machine. Follow all recommended precautions and safe operating procedures.

Keep signs in good condition. Immediately replace any missing or damaged signs.

OBSERVE MAXIMUM TRANSPORT SPEED

The maximum transport speed for this implement is 32 km/h (20 mph).

Some tractors are capable of operating at speeds that exceed the maximum transport speed of this implement. Regardless of the maximum speed capability of the tractor being used to tow this implement, do not exceed the implement's maximum transport speed.

Exceeding the implement's maximum transport speed can result in:

- * Loss of control of the tractor/implement combination
- * Reduced or no ability to stop during braking
- * Implement tire failure
- * Damage to the implement structure or its components

Use additional caution and reduce speed when towing under adverse surface conditions, when turning, and when on inclines.

Do not attempt transport if the fully loaded implement weighs more than 1.5 times the weight of the tractor.



SAFETY INFORMATION

WARNING
HELP AVOID INJURY • READ & UNDERSTAND THE OPERATORS MANUAL PROVIDED WITH THIS MACHINE. IF MISPLACED CALL H & S MANUFACTURING AT 715-387-3414 WITH MODEL AND SERIAL NUMBER. • UNDERSTAND ALL SAFETY WARNINGS AND FUNCTION OF CONTROLS. • KEEP SAFETY DEVICES IN PLACE AND WORKING. • KEEP YOURSELF AND OTHERS WELL CLEAR OF MOVING PARTS. • DISCONNECT ALL POWER BEFORE SERVICING OR CLEANING THIS MACHINE. • DO NOT EXCEED 20 MPH
72203A

WARNING	
	STAY CLEAR
1906C	

	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #cccccc; text-align: center; padding: 5px;"> DANGER </td> </tr> <tr> <td style="text-align: center; padding: 5px;"> STAY CLEAR OF RAKE WHEN OPENING OR CLOSING. FAILURE TO HEED THIS WARNING MAY RESULT IN PERSONAL INJURY OR DEATH KEEP CLOTHING, YOURSELF AND OTHERS WELL CLEAR. </td> </tr> </table>	DANGER	STAY CLEAR OF RAKE WHEN OPENING OR CLOSING. FAILURE TO HEED THIS WARNING MAY RESULT IN PERSONAL INJURY OR DEATH KEEP CLOTHING, YOURSELF AND OTHERS WELL CLEAR.
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TRACTOR:

This operator's manual uses the term "Tractor" when identifying the power source.



WARNING

TO PREVENT SERIOUS INJURY OR DEATH

BEFORE YOU ATTEMPT TO OPERATE THIS EQUIPMENT, READ AND STUDY THE FOLLOWING INFORMATION. IN ADDITION, MAKE SURE THAT EVERY INDIVIDUAL WHO OPERATES OR WORKS WITH THIS EQUIPMENT, WHETHER FAMILY MEMBER OR EMPLOYEE, IS FAMILIAR WITH THESE SAFETY PRECAUTIONS.

DO NOT ALLOW PERSONNEL OTHER THAN THE QUALIFIED OPERATOR NEAR THE MACHINE.

Stop the tractor engine, remove ignition key, and allow all mechanisms to stop before cleaning, working, or adjusting on machine.

DO NOT attempt to perform maintenance or repair with tractor running.

DO NOT step up on machine at any time.

DO NOT allow minors to operate or be near the machine.

Loose or floppy clothing should not be worn by the operator.

Stay clear of hydraulic lines, they may be under extreme pressure or heat.

Stay clear of the rake when opening or closing main rake arm beams, opening the backbone or raising and lowering the rake wheels.

For transport, always make sure that the hair pin at the rear of the lift pipes, and the transport lock bars with safety clip pins for main rake beam, are securely locked in place.

To reduce stress on rake arms, lift pipe, springs and spring brackets, reduce the oil flow from the tractor to the lift cylinders whenever possible.

Be sure to raise the rake wheels before opening or closing the main rake beams.

H&S Manufacturing Co. always takes the operator and their safety into consideration and guards exposed moving parts for their protection. However, some areas cannot be guarded or shielded in order to assure proper operation. In addition, the operators manual and decals on the machine itself warn you of further danger and should be read and observed closely.

Study The Above Safety Rules

ATTENTION - BE ALERT - YOUR SAFETY IS INVOLVED

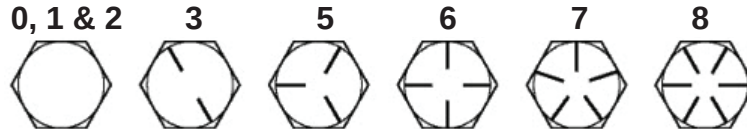
CAP SCREW TORQUE VALUES

The specifications below are the torque values for fasteners as it adheres to the SAE torque value standards. All fasteners should be torqued to the proper values found in the figures below unless otherwise specified by the engineering drawing.

- Lubed torque would be any fastener that has grease, liquid Loctite, oil, etc. on the threads.
- Dry torque would be any fastener which has threads that are clean and dry and do not have any liquid Loctite or grease on them.

Hex Head Fasteners

The figure shown below shows how to determine what SAE grade a fastener is.



SUGGESTED ASSEMBLY TORQUE VALUES

WORKING TORQUE

	SAE GR. 2-6		SAE GR. 5		SAE GR. 8		18-8 SS	316 SS	Brass	Silicon Bronze
Dia. & Thrds. per inch	Dry Ft. Lbs.	Lube Ft. Lbs.	Dry Ft. Lbs.	Lube Ft. Lbs.	Dry Ft. Lbs.	Lube Ft. Lbs.	Inch Lbs.	Inch Lbs.	Inch Lbs.	Inch Lbs.
1/4-20	5.5	4.2	8	6.3	12	9	75.2	78.8	61.5	68.6
1/4-28	6.3	4.7	10	7.2	14	10	94.0	99.0	77.0	87.0
5/16-20	11	8	17	13	24	18	132	138	107	123
5/16-28	12	9	19	14	27	20	142	147	116	131
3/8-16	20	15	30	23	45	35	236	247	192	219
3/8-24	23	17	35	25	50	35	259	271	212	240
7/16-14	32	24	50	35	70	50	376	393	317	349
7/16-20	36	27	55	40	80	60	400	418	327	371
1/2-13	50	35	75	55	110	80	517	542	422	480
1/2-20	55	40	85	65	120	90	541	565	443	502
9/16-12	70	55	110	80	150	110	682	713	558	632
9/16-18	80	60	120	90	170	130	752	787	615	697
5/8-11	100	75	150	110	210	160	1110	1160	907	1030
5/8-18	110	85	170	130	240	180	1244	1301	1016	1154
3/4-10	175	130	260	200	380	280	1530	1582	1249	1416
3/4-16	200	140	300	220	420	310	1490	1558	1220	1382
7/8-9	170	125	430	320	600	450	2328	2430	1905	2140
7/8-14	180	140	470	350	670	500	2318	2420	1895	2130
1-8	250	190	640	480	910	680	3440	3595	2815	3185
1-14	280	210	720	540	1020	760	3110	3250	2545	2885

SET-UP & ASSEMBLY

NOTE: Determine the right or left side of the wheel rake by viewing it from the rear. If instructions or parts lists call for hardened bolts, refer to the Cap Screw Torque Value Chart.

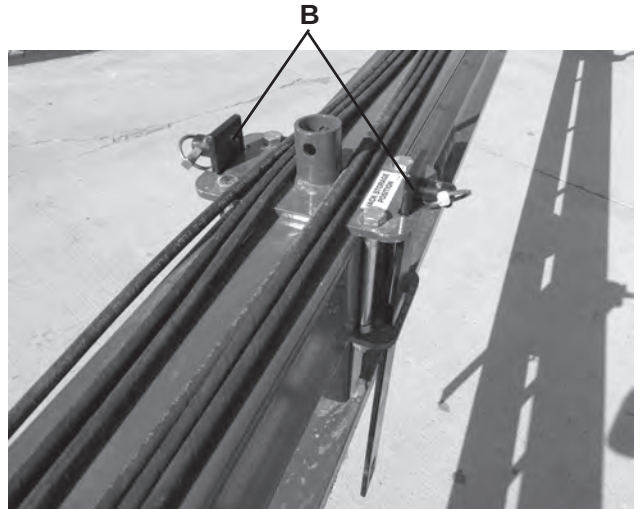
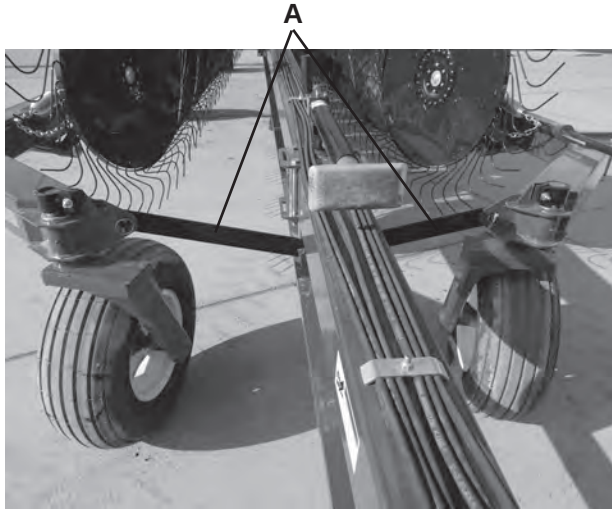
1. Assemble the rake or check the rake for proper assembly and adjustment. Make sure that all bolts are tightened.
2. Attach the wheels with tires, using the lug nuts furnished and torque the mounting hardware to 95 ft./lbs. of torque. Check wheel bolts periodically thereafter.
3. Check tires and inflate to the recommended pressure (11L x 15 to 36 pounds).
4. Lubricate the rake completely (See Lubrication Chapter in This Manual).
5. Tooth bolts must be torqued to 40 ft./lbs. to help prevent excessive tooth breakage.
Re-torque rake tooth bolts after the first 100 acres. Check periodically thereafter.

TRANSPORTING

TRANSPORT LOCKS

Rake Beam Locks

Transport locks are mounted to the front of the pole. (A) Shows the rake locked into transport position. (B) Shows the transport locks in the convenient storage position, to be used when in the raking mode.



Rake Wheel Locks

Located on the lift pipe, is a hair pin which is used to secure the rake wheels in the up position for transport (C). When in the down, or raking position, place the locking hair pin in the convenient storage position (D).



TOWING ON HIGHWAY

Follow state and local regulations when towing farm equipment on public highways. Never tow the rake on a public highway at a speed greater than 20 mph (32 kph).

REFLECTORS

Red and Amber reflective safety decals are on the rake for safety. Refer to the [Decal Placement Chapter](#) for location.

PREPARING FOR OPERATION

1. Adjust the tractor hitch (13 to 17 inches above ground) and attach the rake to the tractor with a **hitch pin and a safety locking device**.
2. There are twelve different positions to adjust the hitch on your rake. The clevis hitch can be flipped for more settings.



3. Remove the weight from lift jack. Remove the jack from the pipe and place it on the convenient storage mount located on the front top of pole.



4. Connect the hydraulic hoses for raising and lowering the rake wheels to a double acting valve on the tractor.
5. Connect the hydraulic hoses for opening and closing the rake to a double acting valve on the tractor.
6. If the rake is equipped with the optional Hydraulic Rear Opening Width Cylinder, connect the hydraulic hoses to a double-acting valve on the tractor.
7. Connect the 7-pin electrical connector to tractor if the rake is equipped with optional lighting.

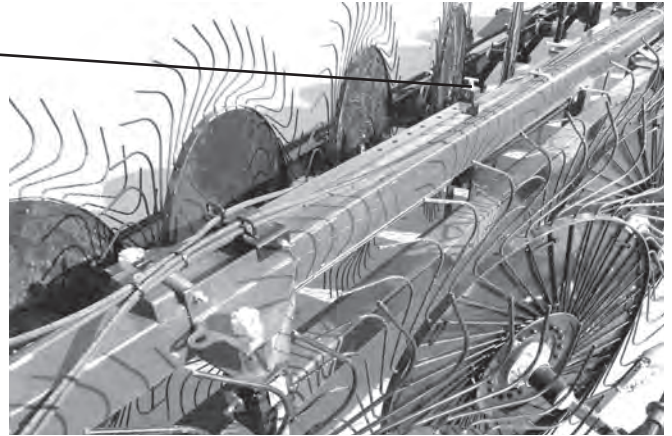
OPERATION & ADJUSTMENTS

EMERGENCY SHUTDOWN

Stop the tractor engine, remove ignition key, and allow all mechanisms to stop before cleaning or working on the machine.

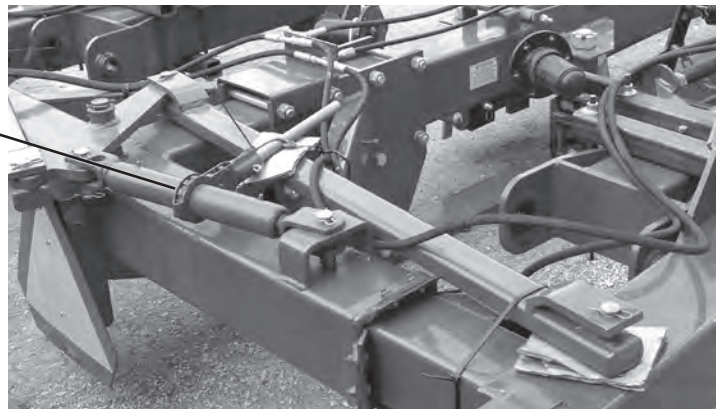
RAKING WIDTH

Raking width is determined by setting the spring-loaded stop, located above the rear pole section as shown.



WINDROW WIDTH

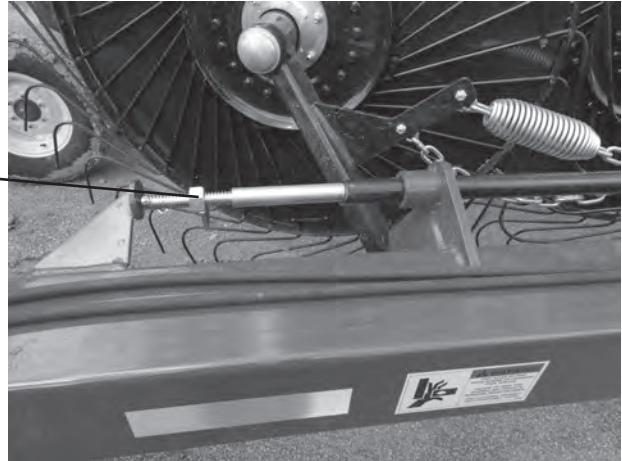
Windrow width adjustment is made by the ratchet jack located on the right rear of the rake as shown.



OPERATION & ADJUSTMENTS

GROUND PRESSURE

Rake wheel to ground pressure is adjusted by turning the tab nut on the threaded rod while the rake wheels are in the raised position. The further forward that the nut is on the threaded rod, the lesser the amount of rake wheel ground pressure. The further back that the nut is on the threaded rod, the greater the amount of rake wheel ground pressure.



GAUGE WHEELS

Outboard gauge wheels are located on the forward section of each rake beam. These gauge wheels support the rake beams to allow the rake wheels to better follow the contour of the ground. Located on each gauge wheel pivot spindle is an adjustable brake assembly. Adjust the brake by tightening bolt and nut. The brake should have enough tension to prevent zig-zag motion, but still allow the wheel to pivot when making corners.



Adjustable
Brake
Assembly

OPTIONAL EQUIPMENT

HYDRAULIC OPENING WINDROW WIDTH ADJUSTMENT

Hydraulic Opening Windrow Width Adjustment is optional in place of the standard ratchet jack. This option requires a 3rd tractor remote.



REAR TANDEM AXLE

Tandem walking beam axles are optional on all models of ***FLEX-FRAME*** Rakes. A single axle is standard.

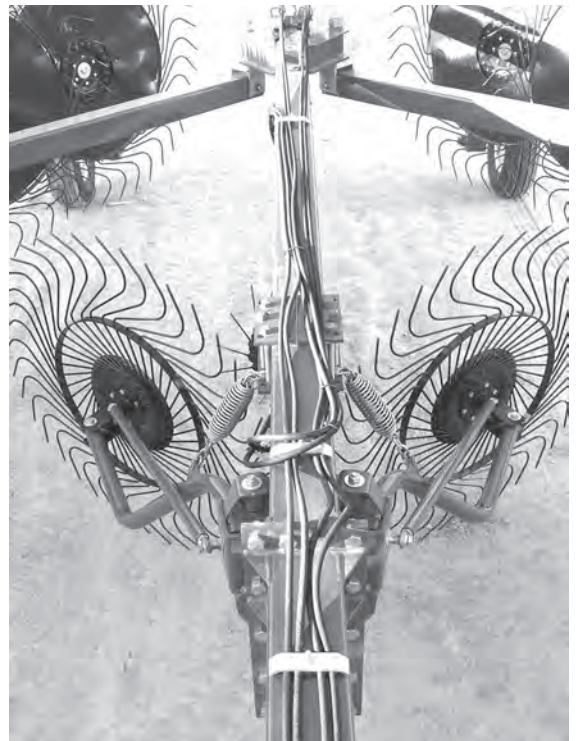


LIGHTING PACKAGE

A Lighting Package that includes tail lights and work lights is optional.

3-WHEEL CENTER KICKER

A 3-Wheel Center Kicker Assembly disturbs and moves the unraked crop in the center.



LUBRICATION GUIDE

GREASE FITTINGS

There are numerous grease fittings on the **FLEX-FRAME** Rake. Lubricating properly and often enough will prolong the life of your rake. Grease daily during normal use and **before and after storage and after power washing**. Use a good grade of high-quality grease. Make sure that grease comes out around the shaft on sleeve type bearings. Wipe off excessive grease to prevent accumulation of chaff or grit around the bearing.

LOCATION

Listed and shown are the description of location and number of grease fittings.

- A. (4) One on each Gauge Wheel
- B. (6 or 8) One on each Transport Wheel Hub - (Single/Tandem)
- C. (2) One on each Rake Arm Swing Pivot
- D. (2) One on each Rake Arm Raise/Lower Rear Flex Pivot
- E. (2) One on each Middle Flex Arm Pivot
- F. (1) One on the Windrow Width Adjustment Cylinder/Jack Pivot
- G. (6) Three on each Rear Rake Arm Linkage Pivot Assembly



A.
One on
each
Gauge
Wheel

B.
One on each Transport
Wheel Hub

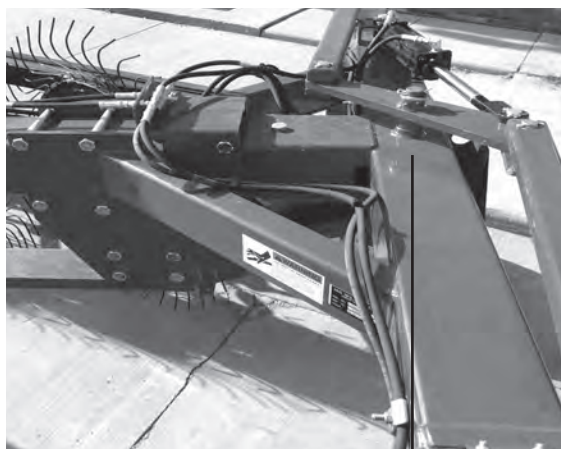
Shown w/optional tandem axles



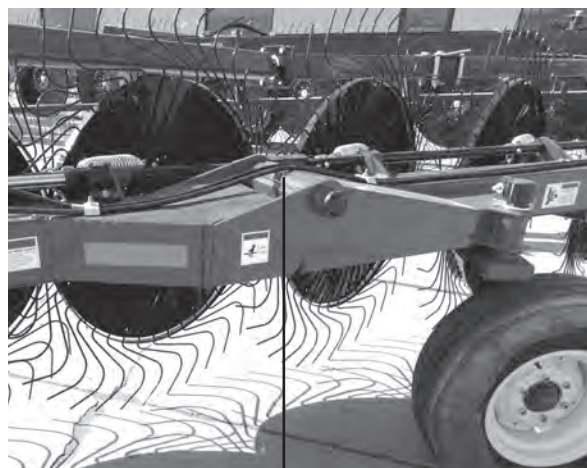
D.
One on each
Rake Arm
Raise/Lower
Rear Flex Pivot

C.
One on each
Rake Arm
Swing Pivot

LUBRICATION GUIDE



F.
One on the Windrow Width
Adjustment Cylinder/Jack Pivot



E.
One on each Middle
Flex Arm Pivot



G.
Three on each Right & Left
Rear Rake Arm Linkage
Pivot Assembly

DECAL LOCATION

Your rake was manufactured with operator safety in mind. Located on the **FLEX-FRAME** Rake are various decals to aid in operation and warn of danger or caution areas. Pay close attention to all the decals.



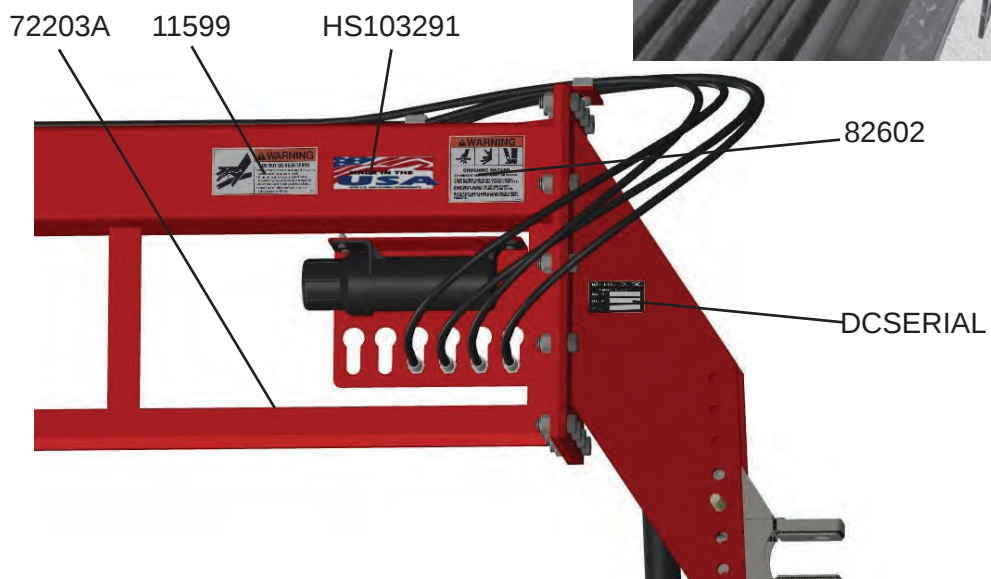
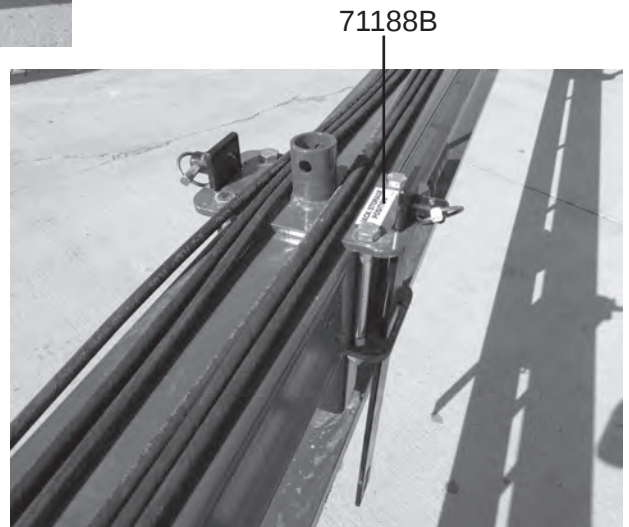
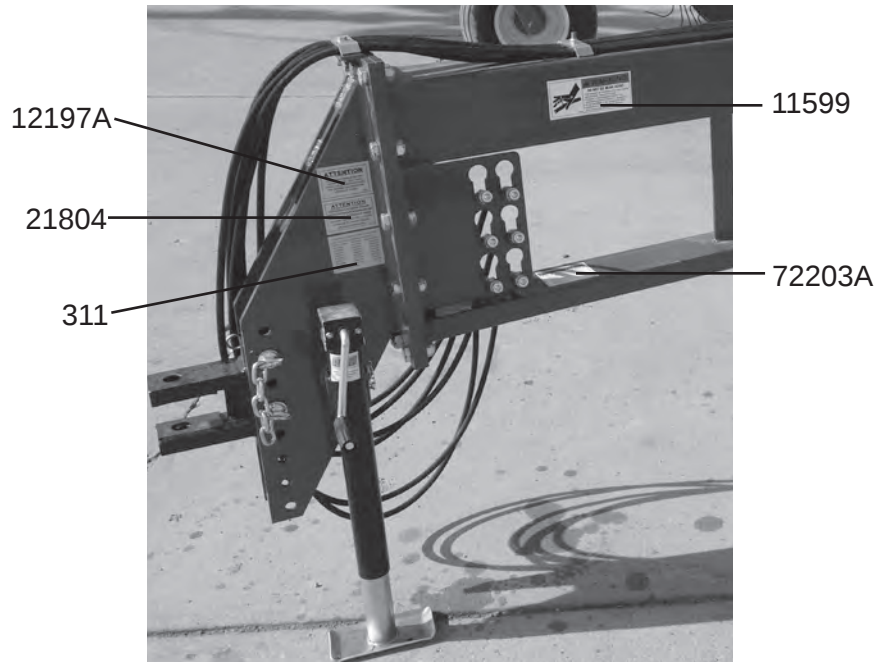
DO NOT REMOVE ANY OF THESE DECALS. IF DECALS ARE LOST, DAMAGED, OR IF THE *FLEX-FRAME* RAKE IS REPAINTED, REPLACE DECALS. REMEMBER: DECALS ARE FOR YOUR PROTECTION AND INFORMATION.

Listed below are the decals on your H&S **FLEX-FRAME** Rake. These decals may be ordered individually by part number or by ordering complete set.

<u>PART</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
311	1	Patent Numbers
1906C	2	Stay Clear
2195	11	WARNING - Stay Clear of Rake
21804	1	Attention - Never Adjust Main Frame
60354	1	H&S FLEX-FRAME Rake RH
60355	1	H&S FLEX-FRAME Rake LH
60356	2	Model Number-6118
60357	2	Model Number-6120
60854	1	H&S FLEX-FRAME Rake Rear
11599	7	WARNING - Do Not Go Near Leaks
11694A	8	DANGER - Stay Clear of Rake
12197A	1	Attention: Raise Rake Wheels
54034	1	Made in the USA - 4"
71188B	1	Jack Storage Position
72203A	1	WARNING - Help Avoid Injury
BFR723	1	SMV Sign Kit
DCAMB	10	Amber Reflector - 2" x 9"
DCRED	2	Red Reflectors
093020	17	Grease Zerk

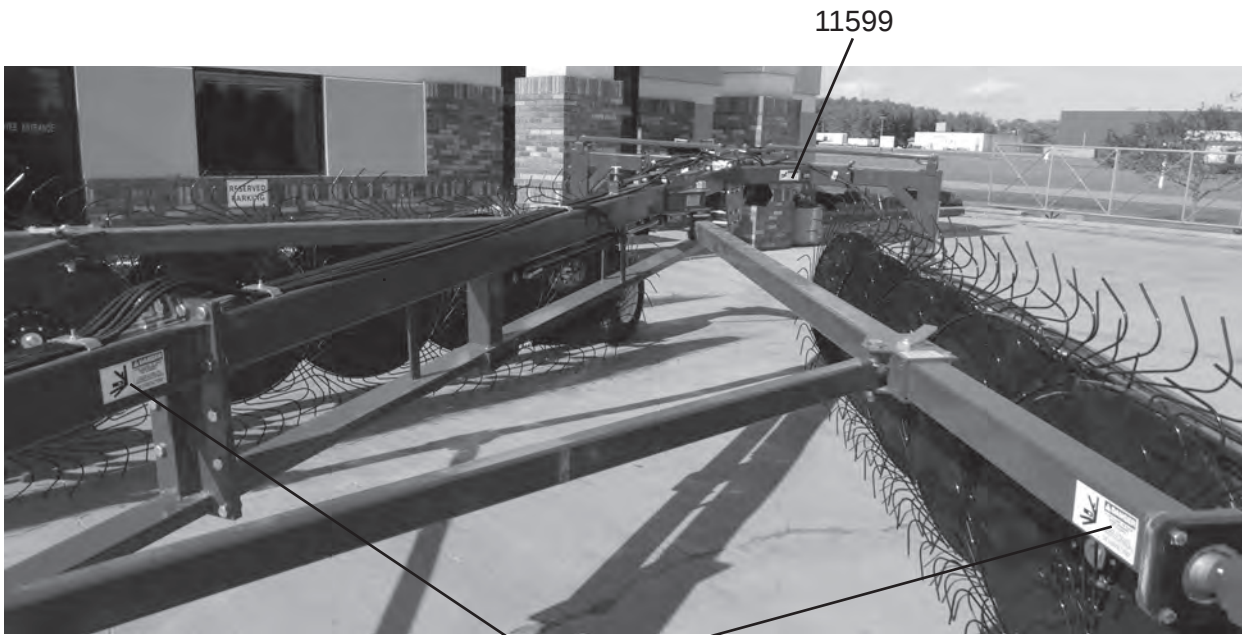
DECAL LOCATION

Hitch/Jack



DECAL LOCATION

Left Rake Beam

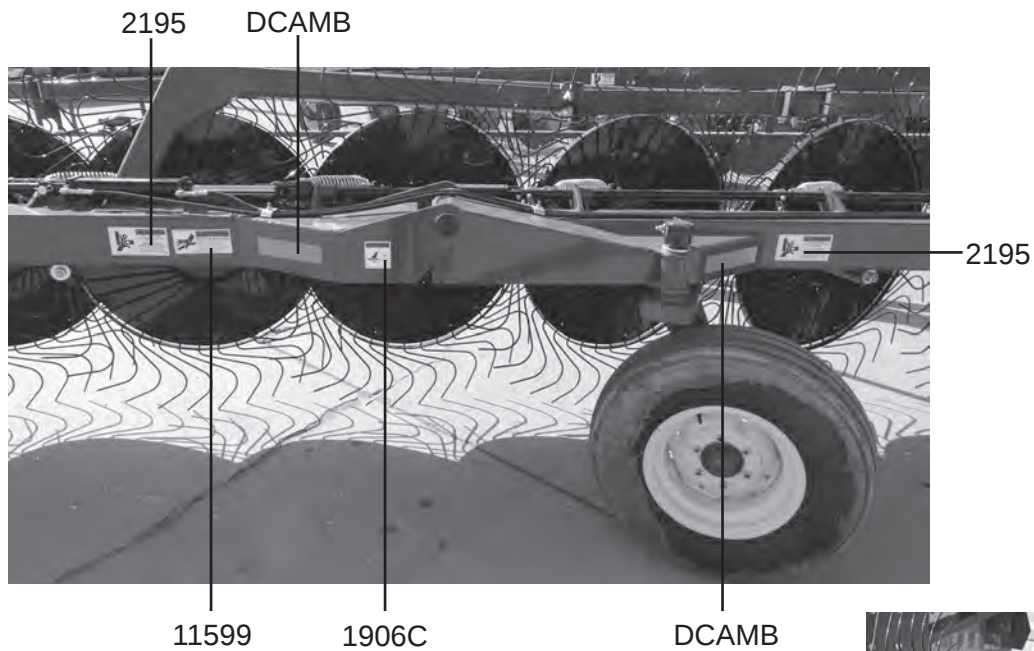
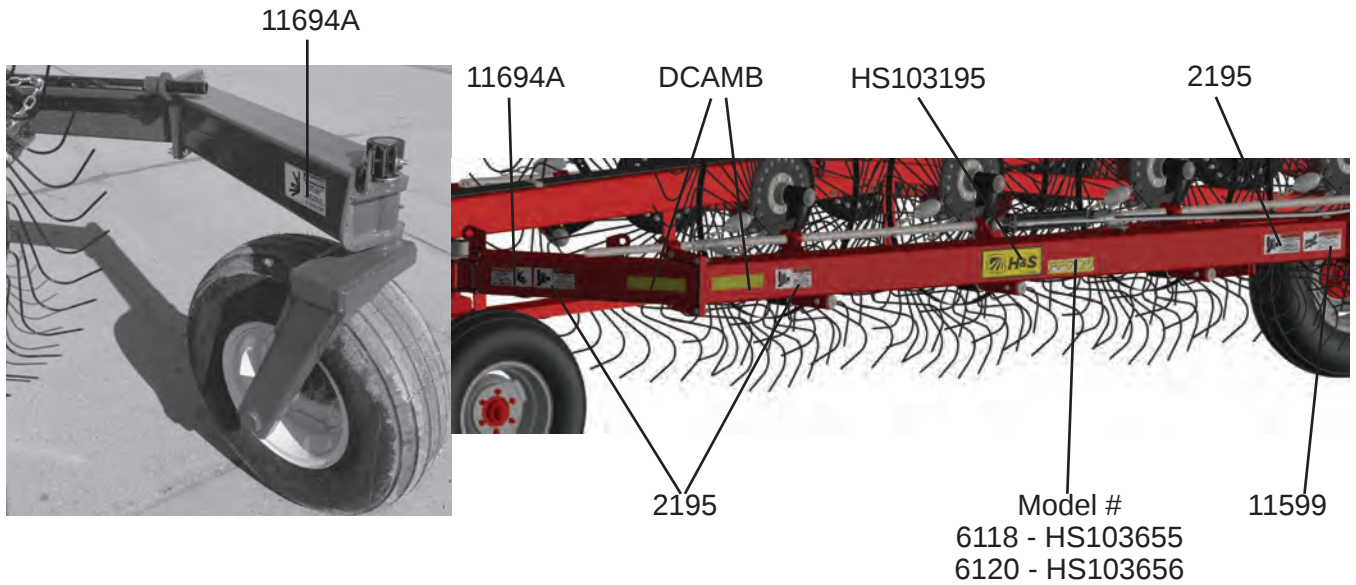


Right Rake Beam



DECAL LOCATION

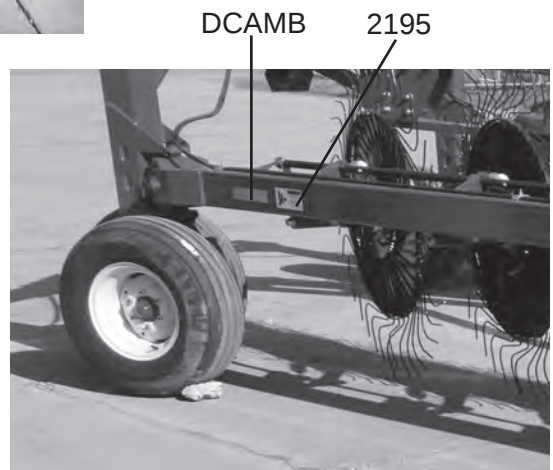
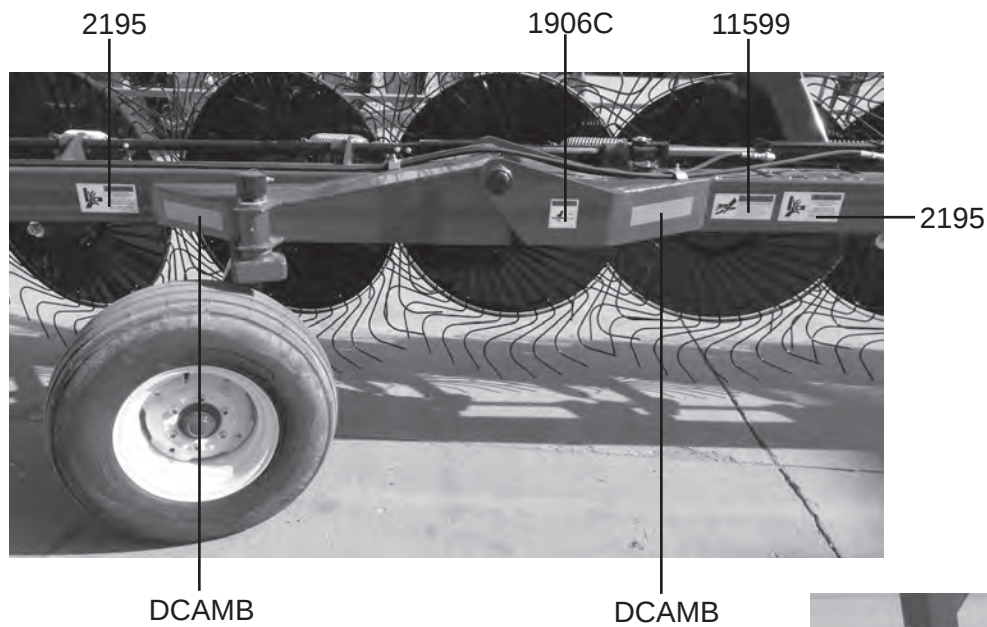
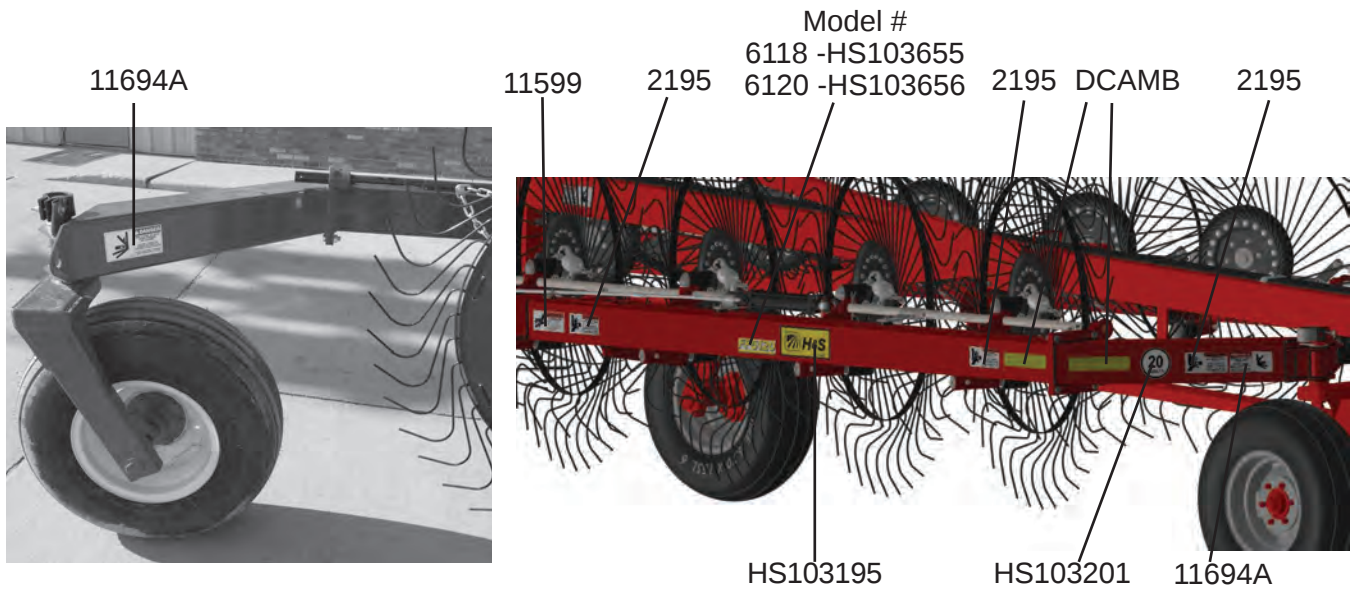
Left Rake Beam



Shown w/optional
tandem axles

DECAL LOCATION

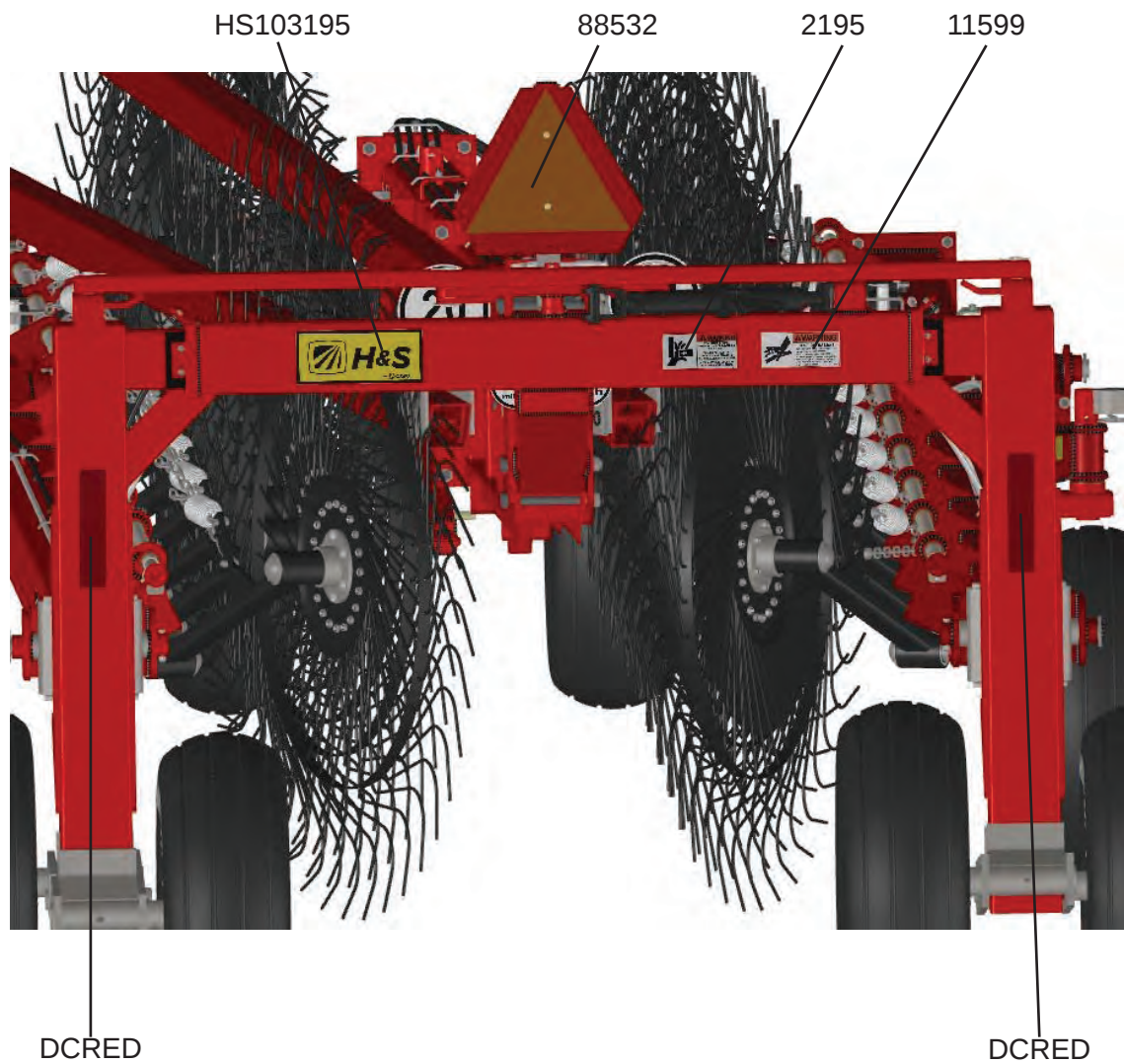
Right Rake Beam



Shown w/optional
tandem axles

DECAL LOCATION

Rear



TROUBLESHOOTING



WARNING:

MAKE SURE THAT THE TRACTOR IS SHUT OFF AND THE RAKE CANNOT MOVE BEFORE SERVICING THE *FLEX-FRAME* RAKE. MAINTENANCE AND REPAIR SERVICE WORK TO BE PERFORMED BY A QUALIFIED SERVICE PERSON ONLY.

<u>TROUBLE</u>	<u>POSSIBLE CAUSE</u>	<u>POSSIBLE REMEDY</u>
Rake Will Not Open	Rake Locked In Transport Hydraulic Couplers Not Coupled To Tractor Properly Hydraulic Hoses Mixed Up With Rake Wheel Lift Hose Tractor Hydraulics Do Not Have Sufficient Pressure	Remove Transport Locks And Return To Storage Position Couple Hydraulic Hoses To Tractor Sort Hoses Correctly And Re-couple To Tractor Tractor Should Have At Least 1500 PSI To Operate Rake NOTE: Always Drive Forward Slowly And Open Rake At The Same Time
Rake Will Not Close	Tractor Hydraulics Do Not Have Sufficient Pressure	Tractor Should Have At Least 1500 PSI To Operate Rake NOTE: Always Drive Forward Slowly And Open Rake At The Same Time
Rake Wheels Will Not Lower	Rake Wheels Locked In Transport Lift Pipe Binding	Remove Hair Pin From Adjuster, Place In Storage Position Check Lift Pipe Make Sure It Is Free Moving

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal grey lines running across the width of the page, typical of notebook or legal stationery. The margins are consistent on all sides, and there is no handwriting or other markings present.

[illegible]

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