

H&S

HDX SERIES

RAKE



WARNING

READ AND UNDERSTAND THIS MANUAL
BEFORE OPERATING THIS EQUIPMENT

UNSAFE OPERATION OR MAINTENANCE OF THIS EQUIPMENT CAN RESULT IN
SERIOUS INJURY OR DEATH

OPERATOR'S MANUAL AND PARTS LIST

HSMFG22007

Manufactured By
H&S MANUFACTURING CO., INC.

P.O. BOX 768 (715) 387-3414 FAX (715) 384-5463
MARSHFIELD, WISCONSIN 54449

H & S
HDX SERIES RAKE
PARTS AND OPERATOR'S MANUAL
CONTENTS

| | |
|--|-------------------|
| Warranty & Warranty Registration Card. | 1-2 |
| Dealer Pre-Delivery & Delivery Checklist. | 3 |
| Be Alert Symbol. | 5 |
| Explanation of Safety Signs. | 6 |
| Danger - Warning Signs. | 7 |
| Warning - Owner Must Read and Understand. | 8 |
| Bolt Torque Chart. | 9 |
| Operation. | 10-12 |
| Adjustments. | 13 |
| Lubrication Guide. | 14 |
| Decal Location & Identification. | 15 |
| Optional Equipment. | 16 |
| Trouble Shooting. | 17 |
| Service Records. | 18 |
| Instructions for Ordering Parts - About Improvements. | 19 |
| Figure 1 - HDX Main Frame. | 20-21 |
| Figure 2 - HDX Rake Beams. | 22-23 |
| Figure 3 - HDX Hydraulics | 24 |
| Figure 4 HDX Hydraulic Cylinders | 25 |
| Figure 5 - HDX Optional 2 Wheel Extension. | 26 |
| Figure 6 - HDX Optional Hydraulic Beam Angle Kit | 27 |
| Figure 7 - HDX Optional Three Wheel Extension. | 28-29 |
| Figure 8 - HDX Optional Transport/Work Lighting | 30 |
| SPECIFICATIONS. | Inside Back Cover |

WARRANTY

H & S 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 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. Warranty service must be performed by H & S or a dealer authorized by H & S to sell and/or service the product involved, which will use only new or remanufactured parts or components furnished by H & S. This warranty includes approved parts and labor to fix 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 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.

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 commercial, custom, for hire 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.

Polybonded (polyethylene and plywood) panels utilized in H & S Manure Spreaders are warranted, to the original purchaser, to not wear through and the polyethylene overlay to not tear free of the plywood for the functional life of the spreader. This specific warranty on polybonded panels includes only replacement of any defective panel part without any allowance for labor beyond the terms of the general warranty (12 or 6 months), and is further limited to manure spreaders used to spread normal agricultural manure.

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, 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.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE OF THIS WARRANTY. H & S and the companies affiliated with it makes no warranties, representations, or promises, express or implied, as to the performance or freedom from defect of its products other than those set forth above and NO IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS OR FITNESS FOR A PARTICULAR PURPOSE IS MADE. IN NO EVENT WILL THE DEALER, H&S OR ANY COMPANY AFFILIATED WITH H&S BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. The ONLY REMEDY the purchaser has in connection with the breach of performance of any warranty on H & S products are those set forth above.

The selling dealer has no authority to make any representation or promise on behalf of H & S, or to modify the terms or limitations of this warranty in any way.

2/04

FILL OUT AND MAIL IMMEDIATELY TO MAKE WARRANTY EFFECTIVE



WARRANTY REGISTRATION

Date of Purchase _____

Purchaser _____ Address _____

City _____ State _____ Zip _____

Product _____ Model# _____ Serial# _____

Dealer _____ Address _____

City _____ State _____ Zip _____

Signature of Original Buyer

IMPORTANT!

Tear on dotted line, provide the information requested on the card. The H&S Warranty is valid **“only”** after this card is received and recorded at H&S Mfg. Co. Mail at once. No postage is required in the U.S.A.



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL Permit No. 195 Marshfield, WI 54449

POSTAGE WILL BE PAID BY ADDRESSEE

H&S Manufacturing Co., Inc.
PO Box 768
Marshfield WI 54449-9963



AFTER COMPLETION, DEALER SHOULD REMOVE AND RETAIN FOR RECORDS

**H&S
DEALER PRE-DELIVERY CHECK LIST**

After the HDX Series 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.

- All grease fittings have been lubricated
(See lubrication guide in this manual).
- All mechanisms are operating trouble free.
- Rake wheels touch ground in unison when lowered into position.
(Rake setting level)
- All bolts and fasteners are tight.
- All decals are in place and legible.

(Dealer's Name)

Model Number

Serial Number

(Signature of Pre-Delivery Inspector)

(Inspection Date)

DEALER DELIVERY CHECK LIST

This check list that follows is an important reminder of valuable information that should be passed on to the customer at the time this HDX Series Rake is delivered.

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

This delivery check list, 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.
- Record Serial Number on page 19 of this Manual.
- Have customer sign a completed "Warranty Registration," and mail it promptly.

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.



**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.

TRACTORS

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

H & S MANUFACTURING CO. INC.

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



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.

⚠ 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




⚠ 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.

11694A



⚠ WARNING

STAY CLEAR OF RAKE WHEN RAISING OR LOWERING RAKE WHEELS.

FAILURE TO HEED THIS WARNING MAY RESULT IN PERSONAL INJURY OR DEATH.

KEEP CLOTHING, YOURSELF AND OTHERS WELL CLEAR.

2195



⚠ WARNING

DO NOT GO NEAR LEAKS

- High pressure oil easily punctures skin causing serious injury, gangrene or death.
- If injured, seek emergency medical help. Immediate surgery is required to remove oil.
- Do not use finger or skin to check for leaks.
- Lower load or relieve hydraulic pressure before loosening fittings.

11599

TRACTORS

This operators manual uses the term “Tractor” when identifying the 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 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.

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

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

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

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

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

For transport, always make sure that the hair pin at the rear of the lift pipes, and the transport lock pins with safety lynch pin for main rake beam cylinder are securely locked in place. If equipped with hydraulic beam angle kit, make sure ball valves on cylinders are in closed position.

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

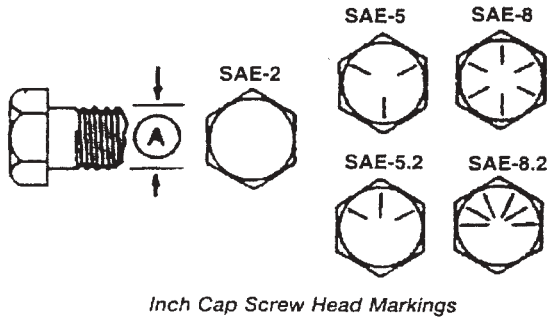
Be sure to raise rake wheels before opening or closing main rake beams.

H&S Mfg. Co. always takes the operator and his 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.

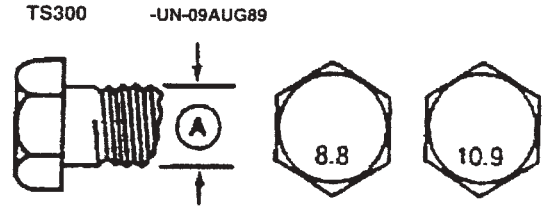
Study The Above Safety Rules

ATTENTION - BE ALERT - YOUR SAFETY IS INVOLVED

CAP SCREW TORQUE VALUES



Inch Cap Screw Head Markings



Metric Cap Screw Head Markings

INCH CAP SCREW TORQUE VALUES

| Bolt Diameter (A) | Wrench Size | Cap Screw Grade | | | | | |
|-------------------|-------------|-----------------|--------|-------|--------|-------|--------|
| | | SAE 2 | | SAE 5 | | SAE 8 | |
| | | N-m | lb.-ft | N-m | lb.-ft | N-m | lb.-ft |
| 1/4" | 7/16" | 7 | (5) | 11 | (8) | 16 | (12) |
| 5/16" | 1/2" | 14 | (10) | 23 | (17) | 33 | (24) |
| 3/8" | 9/16" | 24 | (18) | 41 | (30) | 54 | (40) |
| 7/16" | 5/8" | 41 | (30) | 68 | (50) | 95 | (70) |
| 1/2" | 3/4" | 61 | (45) | 102 | (75) | 142 | (105) |
| 9/16" | 13/16" | 88 | (65) | 142 | (105) | 203 | (150) |
| 5/8" | 15/16" | 122 | (90) | 197 | (145) | 278 | (205) |
| 3/4" | 1-1/8" | 217 | (160) | 353 | (260) | 495 | (365) |
| 7/8" | 1-5/16" | 224 | (165) | 563 | (415) | 800 | (590) |
| 1" | 1-1/2" | 332 | (245) | 848 | (625) | 1193 | (880) |
| 1-1/4" | 1-7/8" | 665 | (490) | 1492 | (1100) | 2393 | (1765) |

METRIC CAP SCREW TORQUE VALUES

| Bolt Diameter (A) | Wrench Size | Markings on Cap Screw Heads | | | |
|-------------------|-------------|-----------------------------|--------|------|--------|
| | | 8.8 | | 10.9 | |
| | | N-m | lb.-ft | N-m | lb.-ft |
| 5 mm | 8 mm | 6 | (4.5) | 9 | (6.5) |
| 6 mm | 10 mm | 10 | (7.5) | 15 | (11) |
| 8 mm | 13 mm | 25 | (18) | 35 | (26) |
| 10 mm | 16 mm | 50 | (37) | 75 | (55) |
| 12 mm | 18 mm | 85 | (63) | 130 | (97) |
| 16 mm | 24 mm | 215 | (159) | 315 | (232) |
| 20 mm | 30 mm | 435 | (321) | 620 | (457) |
| 24 mm | 36 mm | 750 | (553) | 1070 | (789) |
| 30 mm | 46 mm | 1495 | (1103) | 2130 | (1571) |



CAUTION: Use only metric tools on metric hardware. Other tools may not fit properly. They may slip and cause injury.

DO NOT use these values if a different torque value tightening procedure is listed for a specific application. Torque values listed are for general use only. Check tightness of cap screws periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade. Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fastener threads are clean and you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of amount shown in chart. Tighten toothed or serrated-type lock nuts to full torque value.

OPERATION

1. Check for proper assembly and adjustment and make sure that all bolts are tightened. Securely re-tighten after a few hours of operation as bolts can loosen up on new machinery. Check the wheel bolts upon delivery and periodically thereafter. Wheel bolts should be tightened at 85-94 ft./lbs. of torque.
2. Check tires and inflate to recommended pressure (6.70 X 15 to 44 PSI).
3. Adjust tractor hitch (13 to 17 inches above the ground) and attach rake to tractor with a **hitch pin that has a safety locking device**.
4. Remove weight from lift jack. Remove jack from pipe mount and place on convenient storage mount located toward the rear left front pole assembly. (See Picture Below)
5. Connect hydraulic hoses for raising and lowering rake wheels to a single or double acting valve on the tractor.
6. Connect the hydraulic hoses for opening and closing the main frame to a double acting valve on the tractor.
7. If equipped with optional Hydraulic Beam Angle Kit, connect control box to a 12 volt power source on the tractor.
8. Lubricate the rake completely. (See Lubrication Section in This Manual)
9. On all rake wheels, tooth bolts must be torqued to 40 ft/lbs. to prevent excessive tooth breakage **Re-torque rake tooth bolts after the first 100 acres (Part No. FR73). Check periodically Thereafter.**

NOTE: Determine right or left side of your HDX-Rake by viewing it from the rear. If instructions or parts lists call for hardened bolts. See page # 9 to identify.

Jack Storage
Position

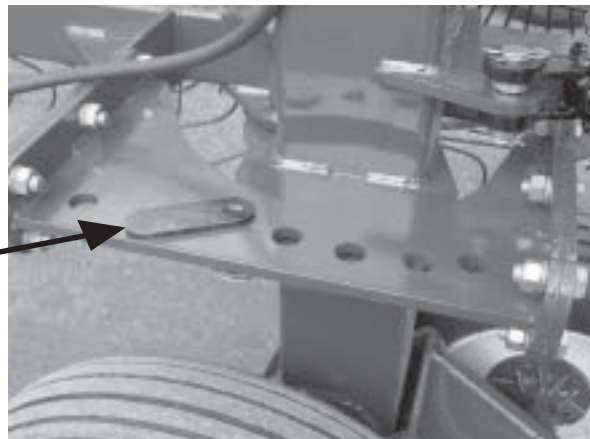


TRANSPORT LOCKS

RAKE BEAM LOCKS

When transporting the standard HDX Series Rake the beam locking pin **must be in the transport hole (A)**. The balance of the holes give you a wide variety of raking widths.

A

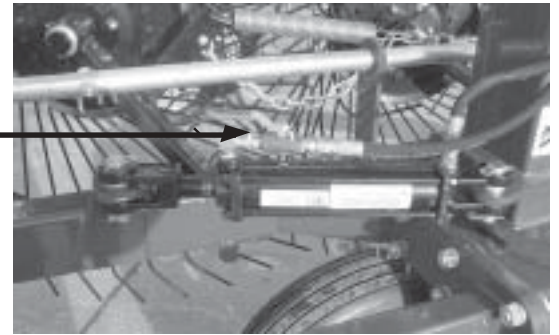


OPERATION *(Continued)*

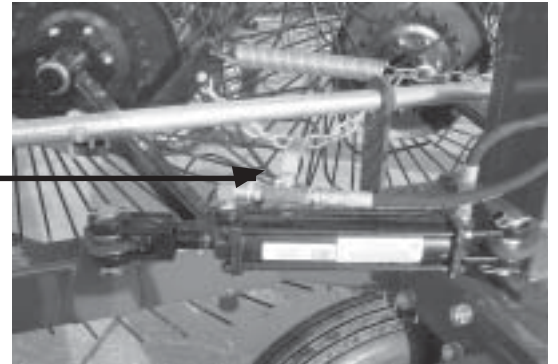
RAKE BEAM LOCKS (OPTIONAL BEAM ANGLE KIT)

If equipped with hydraulic beam angle kit, operational mode is with ball valve in open position (B). For transport position, ball valve must be in closed position as shown (C).

B

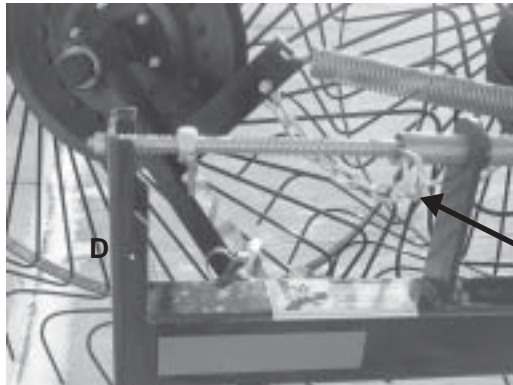


C

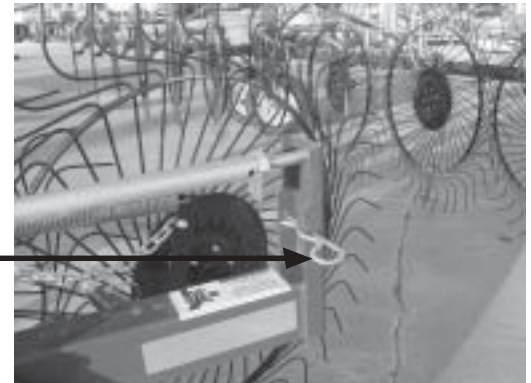


RAKE WHEEL LOCKS

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



E



CENTER FRAME

When opening or closing the center frame of the rake, it is **necessary to have forward or rearward motion to prevent any serious damage to the rake**. Both sides of the rake will open evenly by activating the tractor hydraulic valve when moving forward or rearward.

ATTENTION

NEVER ADJUST MAIN FRAME WIDTH WITHOUT FORWARD OR REARWARD MOTION OF RAKE. FAILURE TO HEED WILL CAUSE DAMAGE TO MAIN FRAME OR AXLE UPRIGHTS.

21804



OPERATION *(Continued)*

CONTROL BOX

The optional Hydraulic Beam Angle Kit requires the use of a control box. When rake beam angling is needed, hold the switch for either the right or left beam. Use the same hydraulic valve that opens and closes the center frame. A solenoid valve will divert the oil to either function the operator chooses.



OPTIONAL HYDRAULIC

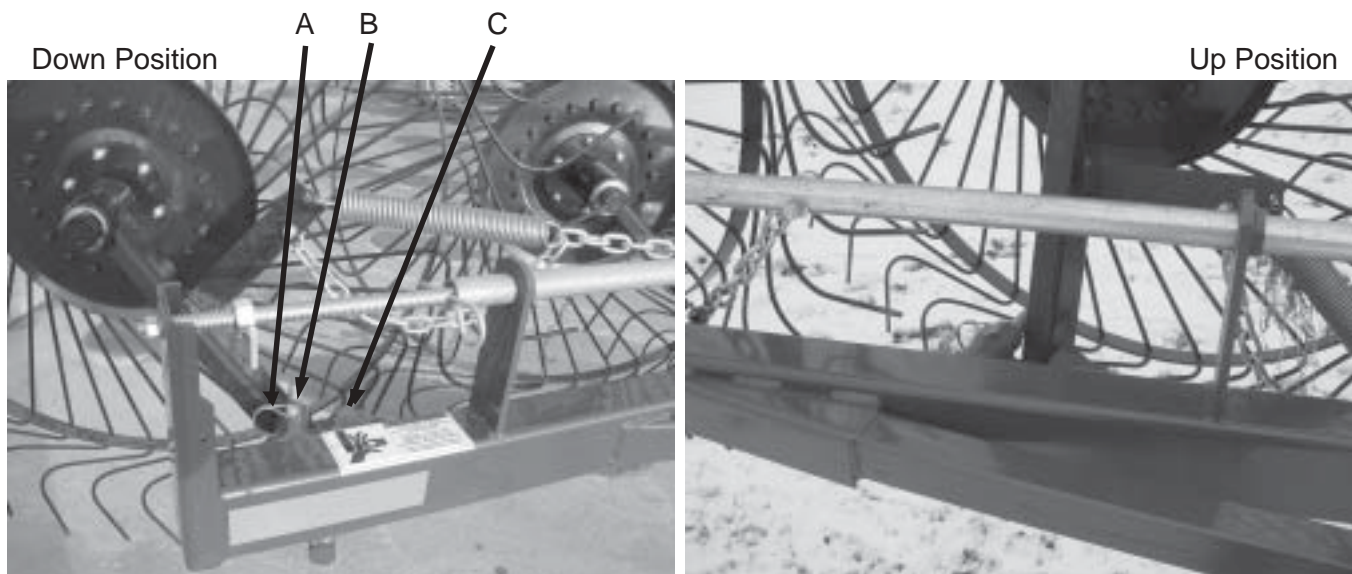
RAKING ANGLE/WINDROW WIDTH

The Raking Angle/Windrow Width adjustment allows the user to cover a wide range of raking widths. Each rake beam can be adjusted independently of each other. This gives the operator the ability to match varying conditions.



EXTENSION WHEEL CONTROLS

The last rake wheel on the left side, and the three rake wheels on the three wheel extension can be individually locked in the up, or non raking position. This gives the operator many different windrow options for varying conditions. To lock rake wheels in the up position, remove clip pin (A). Remove stop pin (B). Raise rake arm up against stop (C). Re-install pin (B) and clip pin (A).



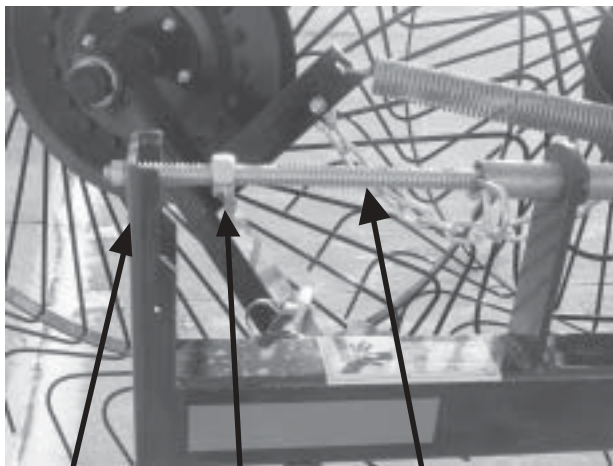
ADJUSTMENTS

RAKE BEAM

Rake beams should be adjusted so they are level to slightly up in the front. They can be adjusted by using the ratchet jack located near the center of the rake. This adjustment is important to keep rake wheel ground pressure even along the rake beam. Failure to do this will cause the front wheels to make heavier or lighter contact with the ground.



RATCHET JACK



C

A

B

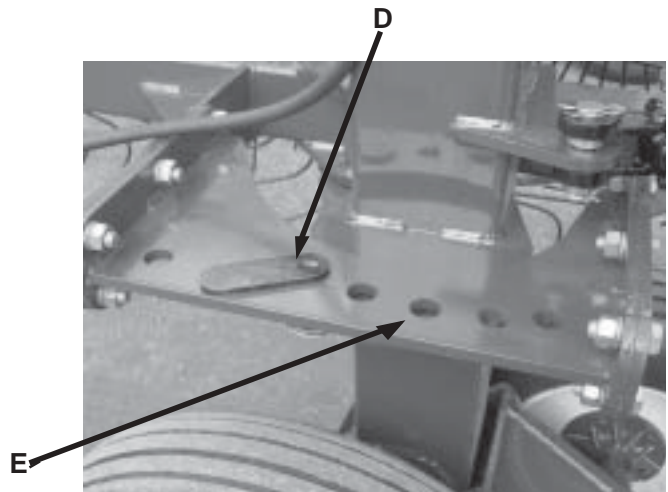
GROUND PRESSURE

Rake wheel ground pressure is adjusted by turning locking Nut and Collar (A) in to decrease pressure or out to increase pressure. The length of the Threaded Rod (B), between (A) and Rear Support (C), will determine the rake wheel ground pressure. Measuring this distance or counting the threads will give you the same ground pressure on both rake beams.

RAKE BEAM ANGLE

Before the rake beams can be angled the center frame must be widened first (as described in the operation section). Failure to do so will cause damage to rake wheels. After the center frame has been widened, angle the rake beams to the desired angle by removing pin(D).

Manually move rake beam to desired rake beam angle and re-insert pin (D) into one in the series of holes (E).



LUBRICATION GUIDE

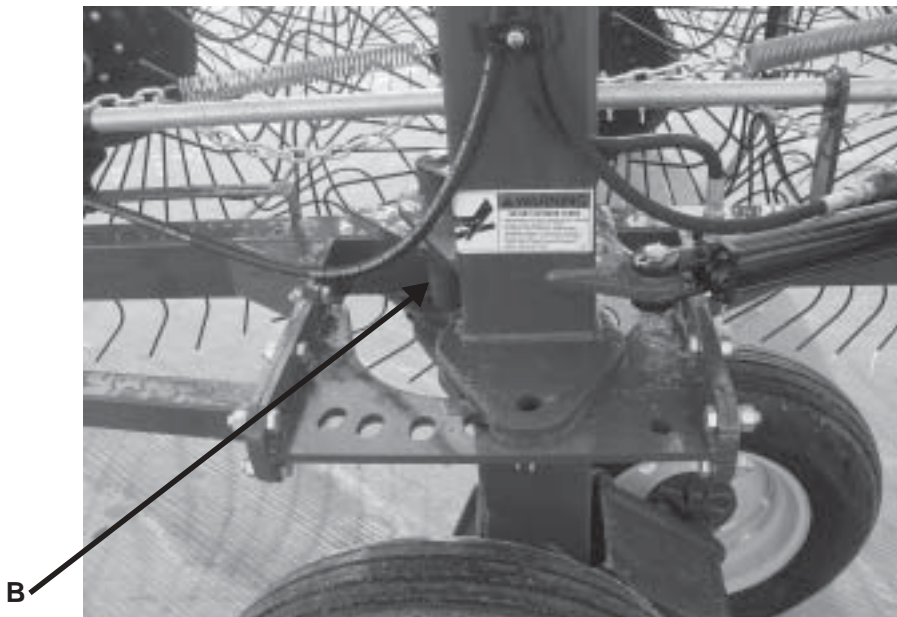
GREASE FITTINGS

There are four grease fittings on the HDX Series Rake. If lubricated properly and often enough, it will prolong the life of your HDX Series 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. (2) One on each Rake Beam Pivot
- B. (2) Ratchet Jack



DECAL LOCATION

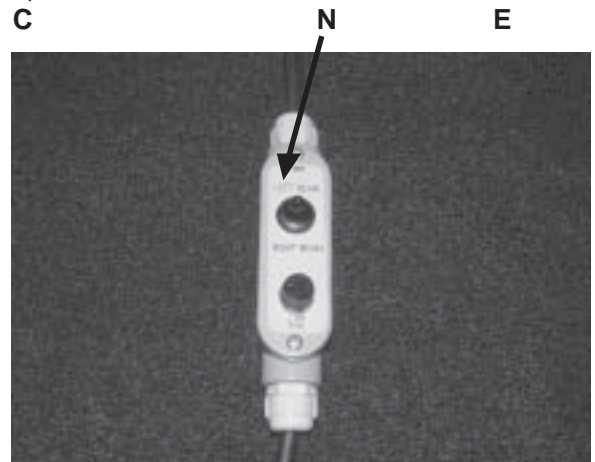
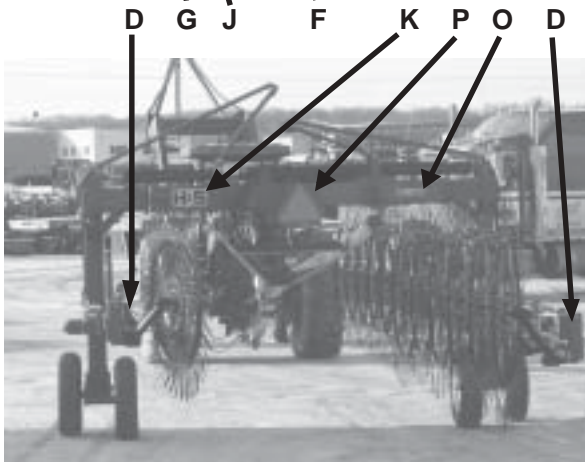
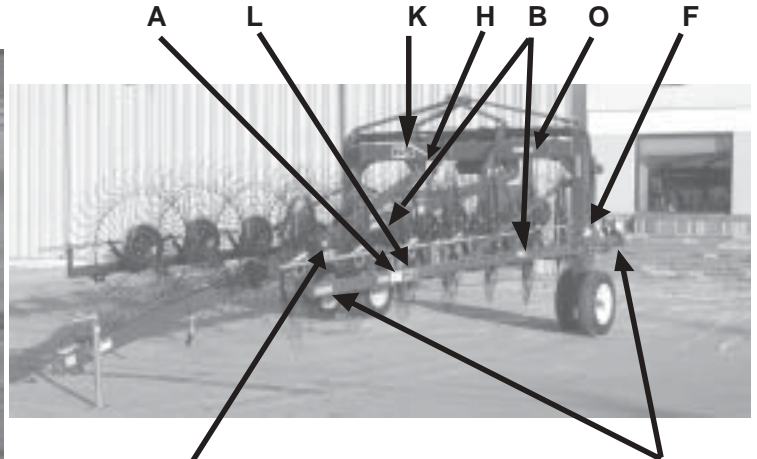
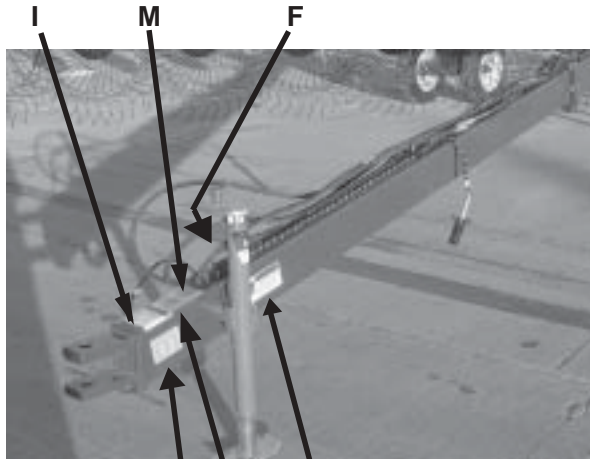
Your H & S HDX Series Rake was manufactured with operator safety in mind. Located on the HDX Series Rake are various decals to aid in operation, and warn of caution areas. Pay close attention to all decals.



DO NOT REMOVE ANY OF THESE DECALS. IF DECALS ARE LOST, DAMAGED, OR IF HDX SERIES RAKE IS REPAINTED, REPLACE DECALS. REMEMBER: DECALS ARE FOR YOUR PROTECTION AND INFORMATION.

Listed below are the decals on your HDX Series Rake. These decals may be ordered individually by part number or by ordering a complete set.

| ITEM | PART NO. | DESCRIPTION |
|------|----------------|--|
| A. | 11694A | (4) DANGER - Stay Clear of Rake |
| B. | 2195 | (4) WARNING - Stay Clear of Rake |
| C. | 71188B | Jack Storage |
| D. | 2X9 Red | (2) Red Reflectors |
| E. | 2X9 Amber | (5) Amber Reflectors (7) W/Two Wheel Extension |
| F. | 11599 | (4) WARNING - Do Not Go Near Leaks |
| G. | H&S | Patent Numbers |
| H. | | Serial Number |
| I. | 72203A | WARNING - Help Avoid Injury |
| J. | 12197A | ATTENTION - Raise Rake Wheels |
| K. | B12 | (2) H & S Decal |
| L. | B8 | (2) H & S Decal |
| M. | 21804 | ATTENTION - Never Adjust Frame |
| N. | 11805 | Beam Control Box Decal (Optional Hyd. Beam Angle Kit Only) |
| O. | 11807A | (4) HDX-Rake |
| P. | | SMV Sign |
| | 22007-HDX Rake | Complete Set of Decals |



OPTIONAL EQUIPMENT

THESE OPTIONS MAY BE ADDED TO YOUR RAKE AT ANY TIME

HYDRAULIC BEAM ANGLE

The optional hydraulic beam angle kit is available for the HDX Series Rakes. This allows the operator to adjust the raking width at any time from the tractor seat.

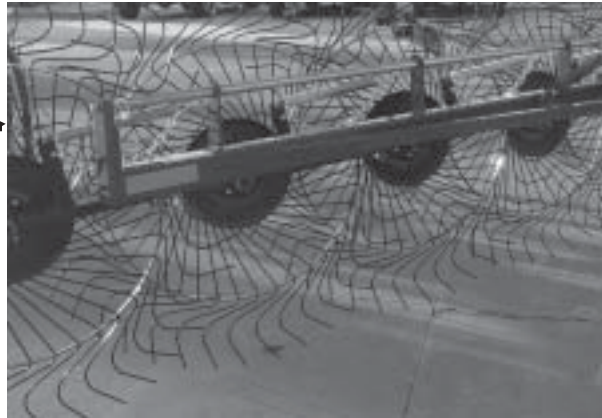


Two Wheel Extension

The optional two wheel extension is added to the front left and right side of the rake. This converts an X14 to an X16, and an X17 to an X19 HDX Series Rake. This will increase raking width by 3'6".

Three Wheel Extension

Added to the right rear rake beam, the three wheel extension converts an X14 into an X17, or an X16 into an X19 HDX Series Rake. Adding the three wheel extension eliminates the need for a center kicker wheel by turning the hay in the center of the rake.



Transport /Work Lights

The optional transport/work lights are available for your HDX Series Rake. This option provides added safety during transport, and also provides better visibility during dusk and night raking.

TROUBLE SHOOTING



WARNING

MAKE SURE THAT THE TRACTOR IS SHUT OFF AND THE RAKE CAN NOT MOVE BEFORE SERVICING THE HDX SERIES 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> |
|----------------------------|---|--|
| Main Frame Will Not Open | Hydraulic Lever Not Engaged or Engaged in Wrong Direction | Engage Hydraulic Lever In Opposite Direction |
| | Hydraulic Hoses Not Connected to Tractor Properly | Check Hydraulic Hoses For Proper Connection |
| | Hydraulic Hoses Mixed Up With Rake Wheel Lift Hose | Sort Hoses and Re-Couple To Tractor |
| | Tractor Hydraulics Do Not Have Sufficient Pressure | Tractor Should Have At Least 2250 PSI To Operate Rake Note: Tractor Must Have Forward Or Rearward Motion To Avoid Any Damage To Rake When Opening Or Closing main Frame |
| Rake Wheels Will Not Lower | Transport Lock Hair Pins Still Engaged | Remove Transport Lock Hair Pins and Place in Storage Position (See Page #13) |
| | Hydraulic Lever Engaged In Wrong Direction | Engage Hydraulic Lever In Opposite Direction |
| | Hydraulic Hose Not Connected To Tractor Properly | Check Hydraulic Hose For Proper Connection |
| | Hydraulic Hose Mixed Up With Frame Opening Hoses | Sort Hose and Re-Couple To Tractor |
| | Tractor Hydraulics Not Able To Operate A Single Acting Cylinder | Check With Your Tractor Dealer How This Can Be Done |
| Rake Wheels Will Not Raise | Hydraulic Lever Engaged In Wrong Direction | Engage Hydraulic Lever In Opposite Direction |
| | Hydraulic Hose Not Connected To Tractor Properly | Check Hydraulic Hose For Proper Connection |
| | Hydraulic Hose Mixed Up With Frame Opening Hoses | Sort Hose and Re-Couple To Tractor |

INSTRUCTIONS FOR ORDERING PARTS

All service parts should be ordered through your authorized H & S dealer. They will be able to give you faster service if you will provide them with the following

1. Model & Serial number is located on the inside right pole mount, under center frame.
2. All reference to left or right apply to the machine as viewed from the rear.
3. Parts should not be ordered from illustration only. Please order by complete part number.
4. If your dealer has to order parts - give shipping instructions:

VIA truck - large pieces (please specify local truck lines)

VIA United Parcel Service (include full address)

| | |
|-------------------|----------------------|
| H&S MFG. CO. INC. | |
| MARSHFIELD, WIS. | |
| MOD. NO. | <input type="text"/> |
| SER. NO. | <input type="text"/> |
| DESCR. | <input type="text"/> |

PLEASE RECORD NUMBERS FOR YOUR UNIT FOR QUICK REFERENCE

ABOUT IMPROVEMENTS

H & S IS CONTINUALLY STRIVING TO IMPROVE IT'S PRODUCTS

We must therefore, reserve the right to make improvements or changes whenever it becomes practical to do so without incurring any obligation to make changes or additions to the equipment previously sold.

FIGURE 1

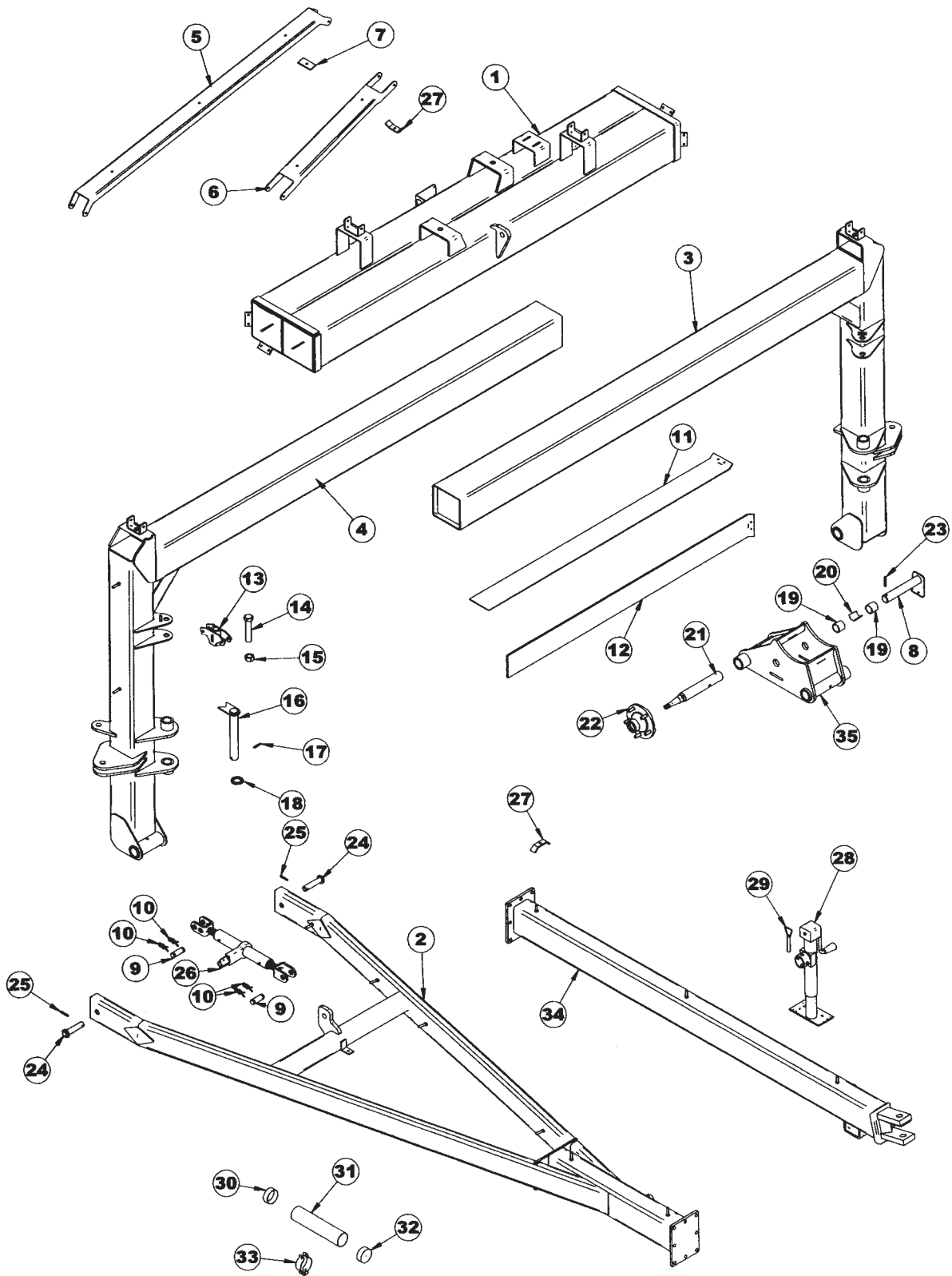


FIGURE 1
HDX SERIES RAKE
MAIN FRAME

| ITEM | PART NO. | DESCRIPTION |
|-------------|-----------------|------------------------------|
| 1. | XR78 | Main Frame |
| 2. | XR79 | Pole Top |
| 3. | XR80 | Left Axle Upright |
| 4. | XR81 | Right Axle Upright |
| 5. | XR82 | Long Hose Carriage |
| 6. | XR83 | Short Hose Carriage |
| 7. | XR84 | Hose Carriage Clamp |
| 8. | XR52 | Tandem Pivot Pin |
| 9. | T143 | Jack Pin |
| 10. | T144 | Hair Pin |
| 11. | XR85 | HDX Thick Poly Slide |
| 12. | XR86 | HDX Thin Poly Slide |
| 13. | XR72 | Heavy Stabilizer Pivot |
| 14. | XR11 | 1" X 5" Gr. 5 Bolt |
| 15. | BFR178 | 1" Top Lock Nut |
| 16. | XR96 | Beam Pivot Pin |
| 17. | F26 | 5/16" X 2-1/4" Expansion Pin |
| 18. | XR13 | Beam Pivot Pin Washer |
| 19. | BFR625 | Bushing |
| 20. | XR53 | Tandem Bushing Spacer |
| 21. | XR15 | MHD Removable Spindle |
| 22. | BFR60 | Hub |
| * | BFR57 | Seal |
| * | BFR58 | Inner Bearing |
| * | BFR59 | Inner Race |
| * | BFR61 | Outer Race |
| * | BFR62 | Outer Bearing |
| * | BFR63 | Washer |
| * | BFR64 | Nut |
| * | BFR65 | Cotter Pin |
| * | BFR66 | Hub Cap |
| * | BFR143 | Stud Bolt |
| * | BFR144 | Nut |
| * | BFR67 | Wheel 15 X 5 |
| * | BFR128 | 6.70 x 15 Tire |
| 23. | 12V59 | Roll Pin 3/8" X 2-3/4" |
| 24. | XR16 | Pole Hinge Pin |
| 25. | 3G22 | 5/16" X 1-3/4" Roll Pin |
| 26. | T138 | Ratchet Jack |
| 27. | HE42 | Four Hose Clamp |
| 28. | BFR223 | Jack |
| 29. | BFR4 | Jack Pin & Chain |
| 30. | S414 | Cap |
| 31. | S415 | Manual Holder Tube |
| 32. | S418 | Cap W/Hole |
| 33. | S416 | Manual Hanger Clamp |
| 34. | XR87 | Pole Bottom |
| 35. | XR88 | HDX Left Tandem |
| * | XR89 | HDX Right Tandem |

NOTE: * (MEANS NOT SHOWN)

FIGURE 2

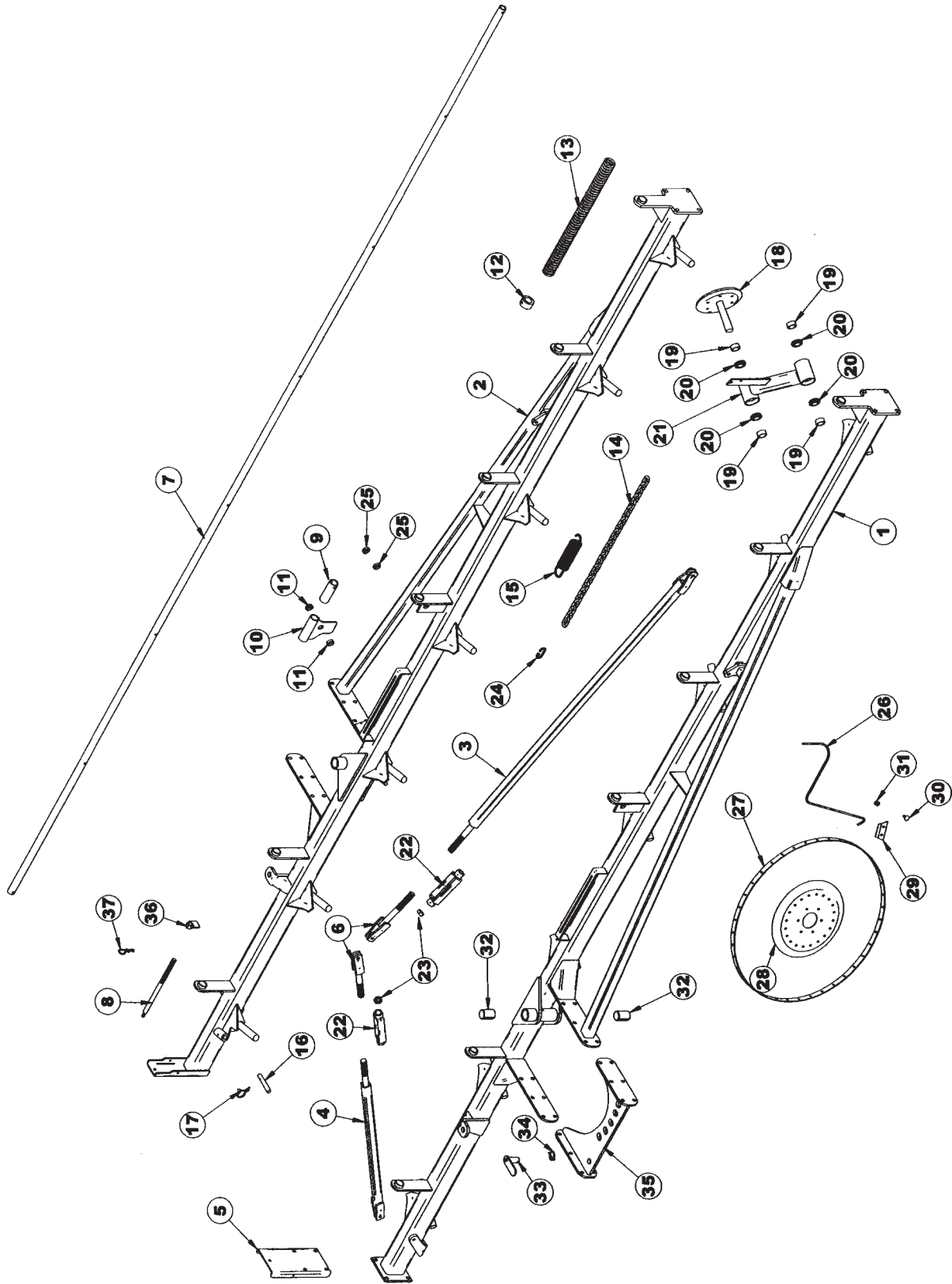
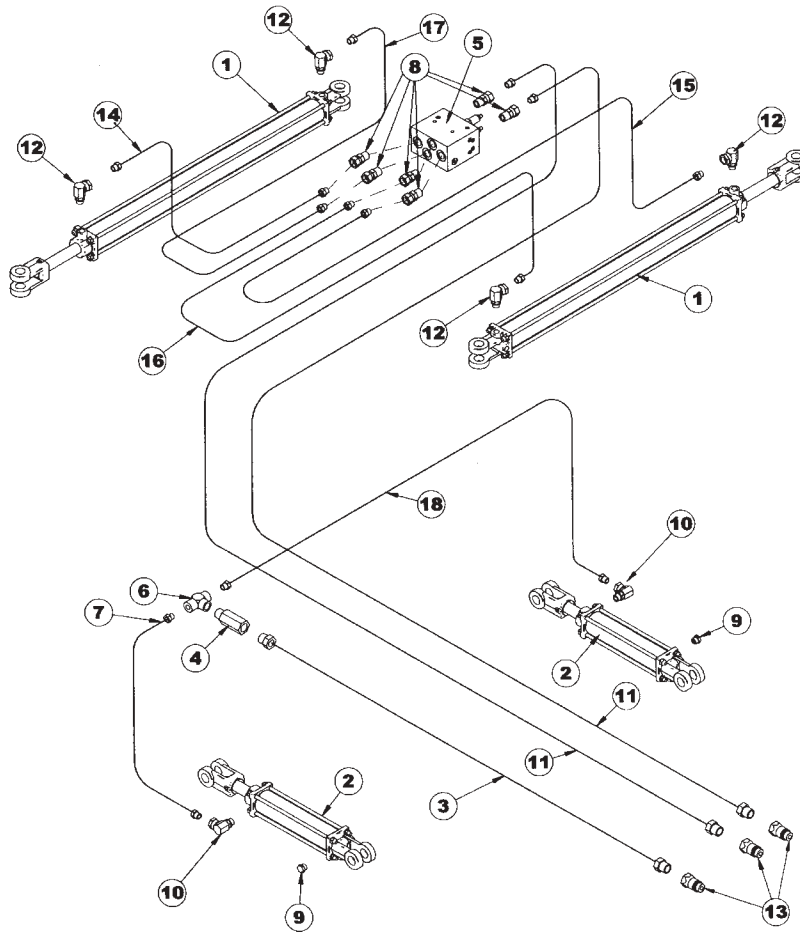


FIGURE 2
HDX SERIES RAKE
RAKE BEAMS

| ITEM | PART NO. | DESCRIPTION |
|-------------|-----------------|----------------------------|
| 1. | XR90 | Right Rake Beam |
| 2. | XR91 | Left Rake Beam |
| 3. | XR92 | HDX Long Stabilizer |
| 4. | XR93 | HDX Short Stabilizer |
| 5. | XR22 | Lift Pipe Stop |
| 6. | HD116 | Turnbuckle End |
| 7. | XR94 | Main Lift Pipe |
| 8. | HD154 | Acme Rod |
| 9. | XR25 | Long Lift Pipe Collar |
| 10. | XR26 | Lift Cylinder Slide |
| 11. | K132 | 3/8" Pipe Spacer |
| 12. | BFR82 | Pipe Clamp |
| 13. | XR27 | Heavy Lowering Spring |
| 14. | XR28 | Rake Arm Chain |
| 15. | BFR138 | Rake Arm Spring |
| 16. | XR29 | Stop Pin |
| 17. | DWM324 | Safety Snap Pin |
| 18. | BFR657 | Rake Wheel Hub |
| * | 17G141 | 3/8" X 1-1/4" Gr. 5 Bolt |
| * | K93 | 3/8" Lock Nut |
| 19. | F16 | Lock Collar |
| 20. | BFR525 | Bearing |
| 21. | BFR490 | RH Rake Arm |
| * | BFR489 | LH Rake Arm |
| 22. | HD114 | Turnbuckle |
| 23. | HD115 | 1" Jam Nut |
| 24. | XR65 | 1/4" Quick Link |
| 25. | X94 | 5/16" Pipe Spacer |
| 26. | FR73 | Rake Wheel Tooth |
| 27. | FR72 | Outer Ring |
| 28. | FR71 | Rake Wheel Center |
| 29. | FR74 | Rake Tooth Clip |
| 30. | T175 | 10MM X 25MM Carriage Bolt |
| 31. | BFR652 | 10MM Lock Nut |
| * | FR69 | Rake Wheel LH |
| * | FR70 | Rake Wheel RH |
| 32. | WM282 | Split Bushing #175-150-125 |
| 33. | XR31 | Transport Lock Pin |
| 34. | F56 | Lynch Pin |
| 35. | XR95 | Beam Angle Plate |
| 36. | BFR426 | Rake Pressure Handle |
| 37. | BFR137 | Hair Pin |

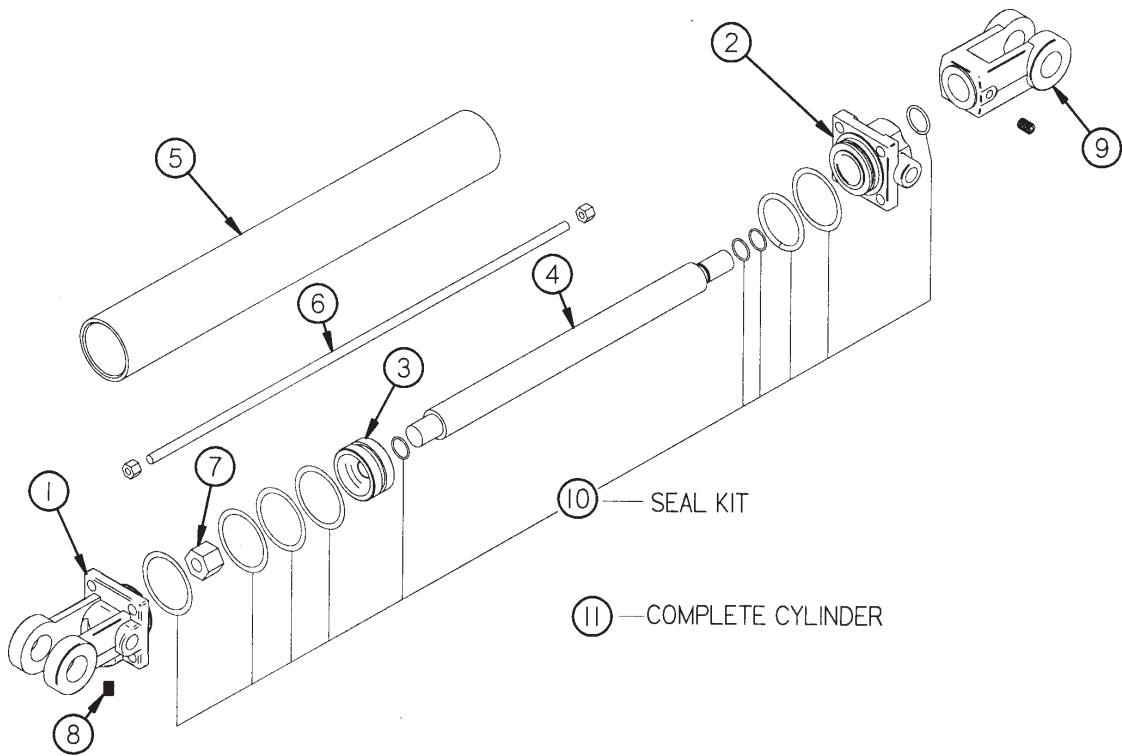
NOTE: * (MEANS NOT SHOWN)

FIGURE 3
HDX HYDRAULICS



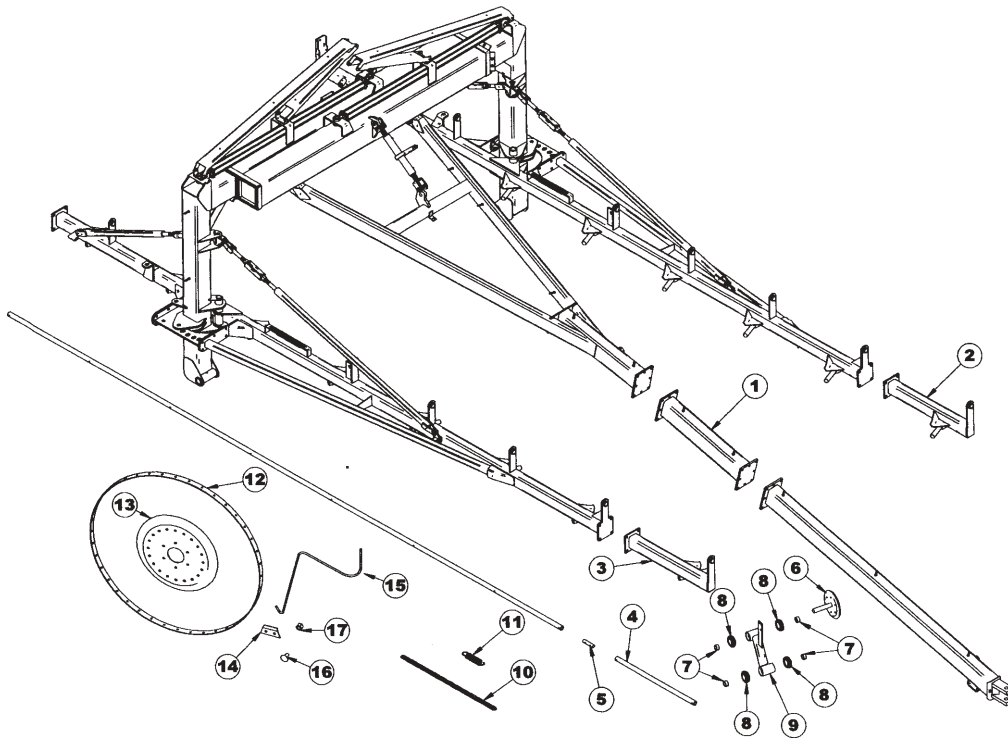
| ITEM | PART NO. | DESCRIPTION |
|------|----------|--|
| 1. | HD136 | Hyd. Cylinder 3-12" X 60" |
| 2. | 16SV171 | Hyd. Cylinder 2" X 10" |
| 3. | XR99 | Hyd Hose 3/8" X 295" 1/2"MP & 1/2" MP |
| 4. | BFR554 | Flow Valve |
| 5. | XR100 | Flow Divider/Counterbalance Valve |
| 6. | DF8 | 1/2" Female Tee |
| 7. | XR116 | Hyd. Hose 3/8" X 220" 1/2"MP & 3/8" MP |
| 8. | XR54 | Female Union Adapter 3/4"O-Ring to 1/2" Pipe |
| 9. | BFR70 | 3/8" Hyd. Vent |
| 10. | DWM110 | 3/8" Street Elbow W/90 Deg. Swivel |
| 11. | XR102 | Hyd. Hose 3/8" X 325" 1/2" MP & 1/2" MP |
| 12. | WM175 | 1/2" 90 Deg. Union Adapter |
| 13. | DWM205 | Male Quick Coupler |
| 14. | XR104 | 3/8" X 74" 1/2" MP & 1/2" MP |
| 15. | XR105 | 3/8" X 52" 1/2" MP & 1/2" MP |
| 16. | XR106 | 3/8" X 27" 1/2" MP & 1/2" MP |
| 17. | XR107 | 3/8" X 11" 1/2" MP & 1/2" MP |
| 18. | XR117 | 3/8" X 244" 1/2" MP & 3/8" MP |

FIGURE 4
HDX Hydraulic Cylinders



| ITEM # | <u>OPTIONAL BEAM ANGLE KIT</u> | <u>RAKE WHEEL LIFT</u> | <u>WIDTH CYLINDER</u> | DESCRIPTION |
|--------|--------------------------------|------------------------|-----------------------|--------------------|
| | <u>2" X 8"</u> | <u>2" X 10"</u> | <u>3-1/2" X 60"</u> | |
| | PART# | PART # | PART# | |
| 1. | 23N142A | " | 16SV157A | Clevis Cap |
| 2. | 23N143A | " | HD189 | Rod Cap |
| 3. | 23N144 | " | HD198 | Piston |
| 4. | T134A | 16SV168A | HD191 | Rod |
| 5. | BFR68 | 16SV169 | HD193 | Cylinder Tube |
| 6. | T168 | 16SV170 | HD195 | Tie Rod |
| 7. | 23N148 | " | DWM198 | Piston Nut |
| 8. | 23N149 | " | DWM199 | Plug |
| 9. | 23N150A | " | DWM200 | Rod Clevis |
| 10. | 23N151 | " | HD197 | Seal Kit |
| 11. | BFR69A | BFR70 | HD136 | Hydraulic Cylinder |

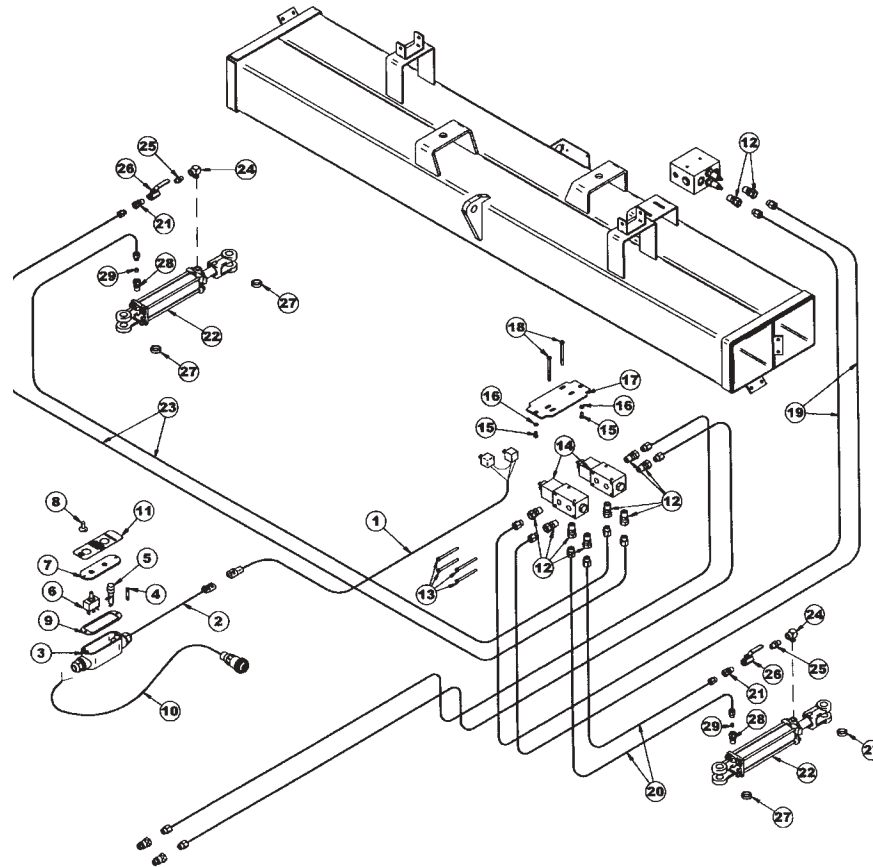
FIGURE 5
HDX SERIES RAKE
OPTIONAL 2 WHEEL EXTENSION KIT



| ITEM | PART NO. | DESCRIPTION |
|------|----------|-----------------------------------|
| 1. | XR111 | Pole Extension |
| 2. | XR112 | Left Front Beam Extension |
| 3. | XR113 | Right Front Beam Extension |
| 4. | XR114 | Lift Pipe Extension |
| 5. | XR41 | Extension Lift Pipe Connector |
| 6. | BFR657 | Rake Wheel Hub |
| * | 17G141 | 3/8" X 1-1/4" Gr. 5 Bolt |
| * | K93 | 3/8" Lock Nut |
| 7. | F16 | Lock Collar |
| 8. | BFR525 | Bearing |
| 9. | BFR490 | RH Rake Arm |
| * | BFR489 | LH Rake Arm |
| 10. | XR28 | Rake Arm Chain |
| 11. | BFR138 | Rake Arm Spring |
| 12. | FR72 | Outer Ring |
| 13. | FR71 | Rake Wheel Center |
| 14. | FR74 | Rake Tooth Clip |
| 15. | FR73 | Rake Wheel Tooth |
| 16. | T175 | 10MM X 25MM Carriage Bolt |
| 17. | BFR652 | 10MM Lock Nut |
| * | FR69 | Rake Wheel LH |
| * | FR70 | Rake Wheel RH |
| * | HE42 | Four Hose Clamp |
| * | BFR635 | Hose 3/8" X 33" - 1/2"MP & 1/2"FP |
| * | XR67 | 33" Pole Extension Cord |

FIGURE6

**HDX SERIES
Hydraulic Beam Angle Option**



| ITEM | PART NO. | DESCRIPTION | ITEM | PART NO. | DESCRIPTION |
|------|----------|---|------|----------|-------------------------------------|
| 1. | XR110 | HDX Pole Cord | 17. | XR44 | Mounting Plate |
| 2. | WM284 | Tractor Supply Cord (5'6") | 18. | XR45 | 1/4" X 3" Socket Head Capscrew |
| 3. | 16SV316 | Control Box | * | K84 | 1/4" Lock Washer |
| 4. | 16SV232 | Fuse | * | LW140 | 1/4" Nut |
| 5. | 16SV231 | Fuse Holder | 19. | XR119 | 3/8" X 40" 1/2"MP&1/2" MP |
| 6. | HD207 | Switch SPDT | 20. | XR118 | 3/8" X 207" 1/2"MP&3/8" MP |
| 7. | 16SV318 | Control Box Cover | 21. | DWM233 | 3/8" Union Adapter |
| 8. | 16SV235 | Switch Boot | 22. | BFR69A | 2" X 8" Cylinder |
| 9. | 16SV317 | Control Box Gasket | 23. | XR101 | 3/8" X 225" 1/2" MP&3/8"MP |
| 10. | 16SV271 | Control Box Power Supply W/Plug in Slots | 24. | 23N234 | 3/8" 90 Deg. Street Elbow |
| 11. | 11805 | Control Box Decal | 25. | BFR188 | 3/8" Close Nipple |
| 12. | XR54 | Female Union Adapter 3/4"O-Ring to 1/2" Pipe | 26. | 16SV338 | 3/8" Ball Valve |
| 13. | 23N1 | 5/16" X 5" Gr. 5 Bolt | 27. | K132 | Pipe Spacer |
| * | RGB39 | 5/16" Lock Washer | 28. | T244 | 3/8"Union Adapter W/.042 Orifice |
| * | 12V65 | 5/16" Nut | 29. | DWM250 | .042 Orifice |
| 14. | FR81 | Solenoid Valve | | | |
| * | FR84 | O-Ring Seal Kit | | | |
| 15. | 80N57 | 3/8" X 3/4" Gr. 5 Bolt | | | |
| 16. | B68 | 3/8" Lock Washer | | | |

NOTE: * (MEANS NOT SHOWN)

Figure 7

HDX RAKE
OPTIONAL 3 WHEEL EXTENSION

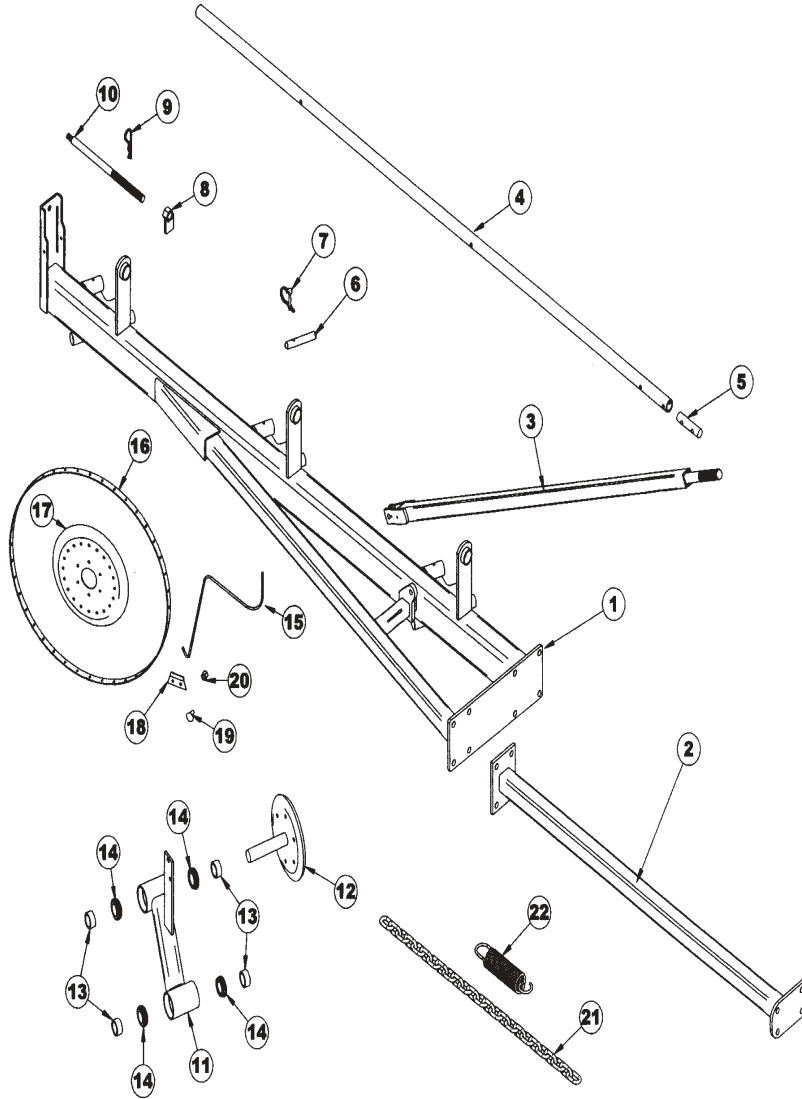
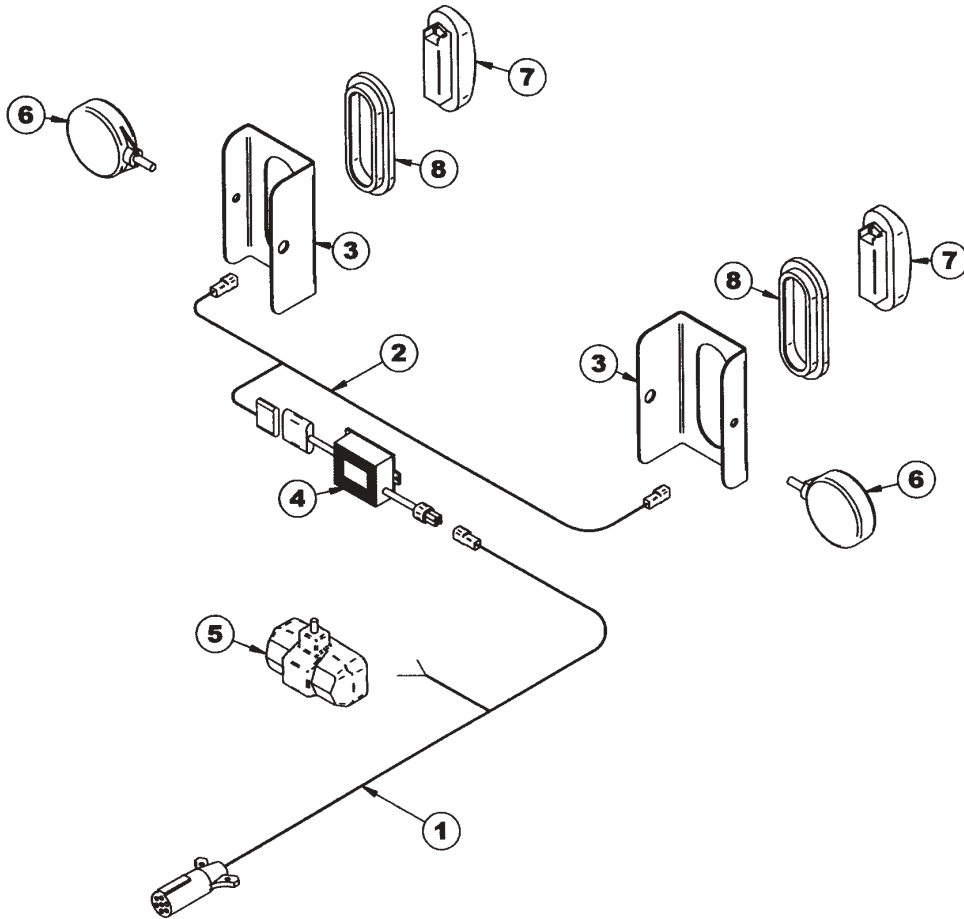


Figure 7
HDX Rake
Optional 3 Wheel Extension

| <u>ITEM #</u> | <u>PART NUMBER</u> | <u>DESCRIPTION</u> |
|----------------------|---------------------------|-------------------------------|
| 1. | XR97 | Y-Rake Extension |
| 2. | XR98 | Forward Brace |
| 3. | XR92 | Stabilizer |
| 4. | XR103 | Y-Extension Lift Pipe |
| 5. | XR41 | Extension Lift Pipe Connector |
| 6. | XR29 | Stop Pin |
| 7. | DWM324 | Safety Snap Pin |
| 8. | BFR426 | Rake Pressure Handle |
| 9. | BFR137 | Hair Pin |
| 10. | HD154 | Acme Rod |
| * | 17G141 | 3/8" X 1-1/4" Gr. 5 Bolt |
| * | K93 | 3/8" Lock Nut |
| 11. | BFR490 | Rake Arm RH |
| 12. | BFR657 | Rake Wheel Hub |
| 13. | F16 | Lock Collar |
| 14. | BFR525 | Bearing |
| 15. | FR73 | Rake Wheel Tooth |
| 16. | FR72 | Outer Ring |
| 17. | FR71 | Rake Wheel Center |
| 18. | FR74 | Rake Tooth Clip |
| 19. | T175 | 10MM X 25MM Carriage Bolt |
| 20. | BFR652 | 10MM Lock Nut |
| 21. | XR28 | Rake Arm Chain |
| 22. | BFR138 | Rake Arm Spring |
| * | FR70 | Rake Wheel RH |

Figure 8
HDX SERIES
OPTIONAL RAKE LIGHTING



| <u>ITEM #</u> | <u>PART NUMBER</u> | <u>DESCRPITION</u> |
|---------------|--------------------|----------------------|
| 1. | XR108 | HDX Pole Light Cord |
| 2. | XR109 | HDX Frame Light Cord |
| 3. | HD148 | Light Bracket |
| 4. | S441 | Light Module |
| 5. | DWM130 | Work Light |
| 6. | DWM129 | Yellow Hazard Light |
| 7. | S310 | Red Tail Light |
| 8. | S308 | Rubber Light Mount |

H&S HDX SERIES RAKE

Your new H&S HDX Series Rake has been manufactured of the finest quality materials and components. The performance you get from your machine is largely dependent upon how well you read and 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 HDX Series Rake before reading this manual carefully. Keep this manual available for ready reference.

HDX SERIES SPECIFICATIONS

| | X14 | X16 | X17 | X19 |
|--------------------------|--|----------------------|----------------------|----------------------|
| Wheel Diameter | 60" | 60" | 60" | 60" |
| Teeth Per Wheel | 40 | 40 | 40 | 40 |
| Tooth Diameter | 7.0mm (.275") | 7.0mm (.275") | 7.0mm (.275") | 7.0mm (.275") |
| Transport Width | 12'5" | 12'5" | 12'5" | 12'5" |
| Transport Length | 26'5" | 29'4" | 34'8" | 37'7" |
| Windrow Width Adjustment | Up to 94" | Up to 94" | Up to 94" | Up to 94" |
| Raking Width | Up to 31' | Up to 34'6" | Up to 31' | Up to 34'6" |
| Rake Wheel Hubs | Sealed Ball Bearings | Sealed Ball Bearings | Sealed Ball Bearings | Sealed Ball Bearings |
| Hitch Jack | Standard | Standard | Standard | Standard |
| Standard Transport | (4-Tandem) | (4-Tandem) | (4-Tandem) | 4-Tandem) |
| Wheels | 6.70 X 15 | 6.70 X 15 | 6.70 X 15 | 6.70 X 15 |
| Weight | 4140 Lbs. | 4400 Lbs. | 4540 Lbs. | 4800 Lbs. |
| Rake Wheel Wind Guards | Optional | Optional | Optional | Optional |
| Transport /Work Lights | Optional | Optional | Optional | Optional |
| Hydraulic Requirements | 1 Double Acting Remote for Main Frame Open & Close 1 Single Acting Remote for Rake Wheel Lift | | | |
| Electrical Requirements | +12 Volt Power Source if Rake is Equipped With Hydraulic Beam Angle Kit | | | |

Warranty:

See Warranty on Page #1

NOTE:

Determine right or left side of HDX Series Rake by viewing it from the rear. If instructions or parts call for hardened bolts see page 9 to identify.

H&S MANUFACTURING CO. INC.

2608 S. Hume Ave.
P.O.Box 768 - Telephone (715) 387-3414
FAX (715) 384-5463
MARSHFIELD, WI 54449



H&S WAREHOUSE Rt #5 and 76
P.O. Box 1260 - Telephone (716) 736-7595
FAX (716) 736-7596
RIPLEY, NY 14775

H&S MFG. CO.

products approved

for the

FEMA

SEAL OF QUALITY

