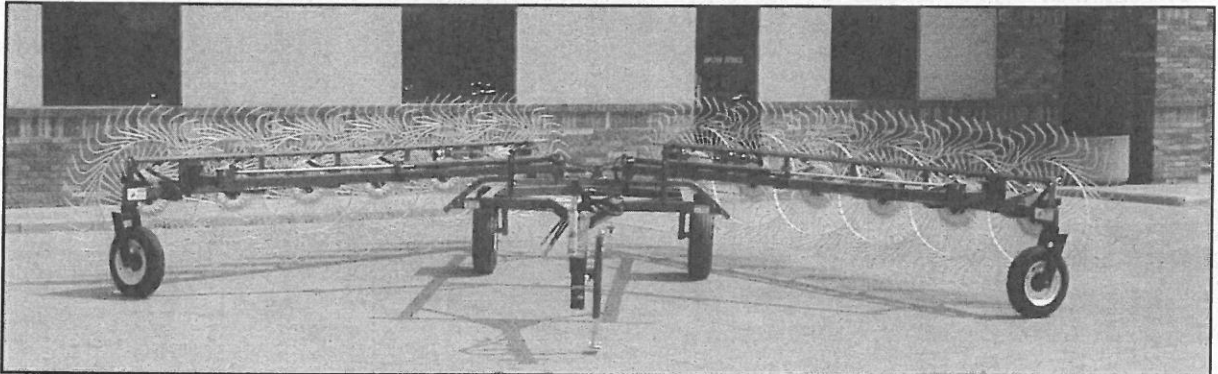


H&S

DELUXE

BI-FOLD RAKE

TWELVE WHEEL
&
SIXTEEN WHEEL BI-FOLD



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

12-3-04

Manufactured By

H&S MANUFACTURING CO., INC.

P.O. BOX 768 • (715) 387-3414 FAX (715) 384-5463

MARSHFIELD, WISCONSIN 54449

H&S
DELUXE BI-FOLD RAKE
PARTS AND OPERATOR'S MANUAL

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WARRANTY

Mr. Owner: Before Operating—Read and Understand Operating and Safety Instructions

H&S Manufacturing Co., Inc. truly believes you have made a wise choice and a sound and lasting investment. Many years of development have made available these quality machines to assure you the performance and reliability you need. **We ask you to read the following agreement and warranty as this unit is subject to this warranty and agreement and no other.**

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 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 over-time 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 to 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 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 quality or 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.

2/16/2004

WARRANTY REGISTRATION

Date of Purchase _____

Purchaser _____ Address _____

City _____ State _____ Zip _____

Product _____ Model # _____ Serial # _____

Dealer _____ Address _____

City _____ State _____ Zip _____

Signature of original buyer

**FILL OUT AND MAIL
IMMEDIATELY TO MAKE
WARRANTY EFFECTIVE**



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.

This Is Your Warranty Card
Please Fill Out
And Mail Immediately

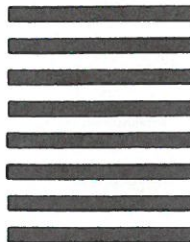


NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

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 Bi-Fold 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 raking position.
(rake sitting level)
- All bolts and fasteners are tight.
- All decals are in place and legible.

Dealer's Name	Model Number
Signature of Pre-Delivery Inspector	Serial Number
	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 Bi-Fold Rake is delivered.

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

This pre-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 he reads and understands all operating and service instructions.
- Record Serial Number on Page 15 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.

Remove Dealers File Copy At Perforation



**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

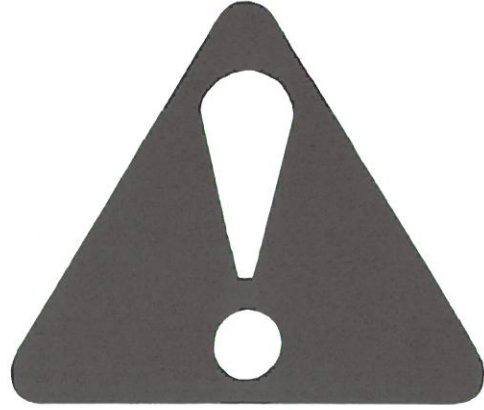
This operator's manual uses the term "Tractor" when identifying the power source for towing and lifting rake.

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



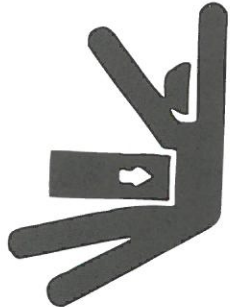
FOLLOW SAFETY INSTRUCTIONS

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	
<ul style="list-style-type: none"> • 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	
 <p>11694B</p>	<p>STAY CLEAR OF RAKE WHEN OPENING OR CLOSING.</p> <p>FAILURE TO HEED THIS WARNING MAY RESULT IN <u>PERSONAL INJURY OR DEATH.</u> KEEP CLOTHING, YOURSELF AND OTHERS WELL CLEAR.</p>

 <p>11694A</p>	<p style="text-align: center;">! DANGER</p> <p style="text-align: center;">STAY CLEAR OF RAKE WHEN OPENING OR CLOSING.</p> <p style="text-align: center;">FAILURE TO HEED THIS WARNING MAY RESULT IN <u>PERSONAL INJURY OR DEATH</u></p> <p style="text-align: center;">KEEP CLOTHING, YOURSELF AND OTHERS WELL CLEAR.</p>
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	<p style="text-align: center;">! WARNING</p> <p style="text-align: center;">DO NOT GO NEAR LEAKS</p> <ul style="list-style-type: none"> • 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. <p style="text-align: right;">11599</p>
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H&S DELUXE BI-FOLD RAKE



W A R N I N G

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 on, or adjusting 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 pins (part # BFR137) at the front of the lift pipes, and the transport locks (part # BFR158) are securely locked in place.

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 closing to transport position.

H&S Mfg. Co. always takes the operator and his safety into consideration and guards exposed moving parts for his 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

OPERATION

1. Check for proper assembly and adjustment and make sure that all bolts are tightened. Securely retighten after a few hours of operation as bolts can loosen up on new machinery. Check wheel bolts upon delivery and periodically thereafter. Wheel bolts should be tightened at 85-95 ft./lbs. of torque.
2. Check tires and inflate to recommended pressure.
3. Adjust the tractor hitch (13 to 17 inches above 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 on hitch gusset near main frame of rake.
5. Connect hydraulic hose for raising and lowering rake wheels from rake to single or double acting valve on the tractor.
6. Connect hydraulic hoses for opening and closing the rake to double acting valve on the tractor.
7. Lubricate the machine completely.
8. On all rake wheels, 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. (Part No. T175) Check periodically thereafter.

ADJUSTMENTS

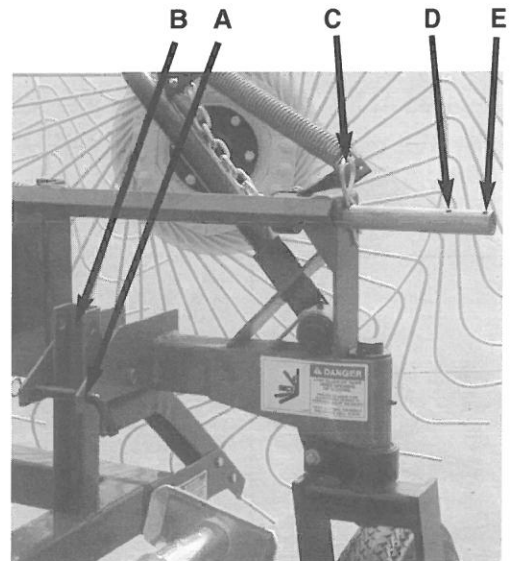
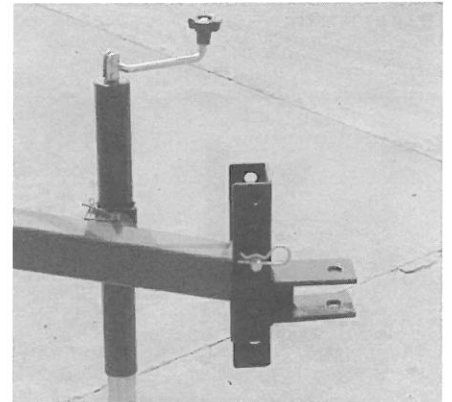
HITCH

There are ten different positions to adjust the hitch on your new Bi-Fold Rake. Hitch should be adjusted so main frame of the rake is level or parallel to the ground.

TRANSPORT LOCKS

There are two transport locks on the Bi-Fold Rake. Located on both sides of rake at the front of the main rake frame are the transport lock pins (part #BFR158) which lock main rake beams. During transport and storage this pin should be in position (A) to prevent rake from opening.

Located on both sides at the front of the rake on the lift tube is the second transport lock (part #BFR137) which locks rake wheels in up position. During transport and storage this pin should be in position (C) to prevent rake wheels from lowering. When you are ready to rake, activate hydraulics to close rake and also to raise rake wheels. Remove pin (BFR158) and place in convenient storage position (B). Remove hair pin (BFR137) and place in hole position (E). Open rake to desired raking width (See Raking Width Adjustment) and lower rake wheels until cylinders are completely collapsed. Rake wheels are now on the ground and you are ready to rake. In this position, rake wheels have the widest floatation range both up and down for raking on hilly or uneven ground. On flat level ground, you may experience excess ground pressure on the rake wheels. This pressure can be eliminated by placing lock pin in the second hole (D) from the end of the lift pipe. In this position downward movement of rake wheels is lessened.



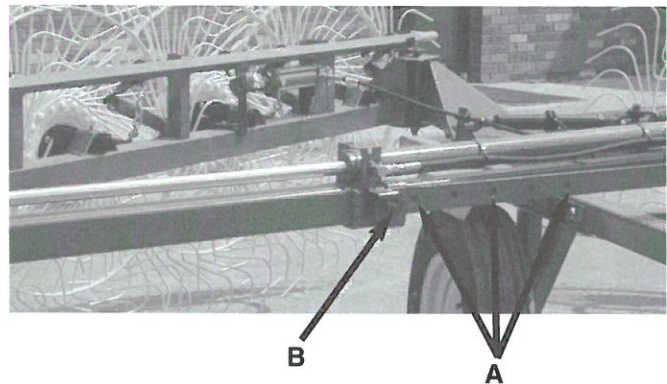
ADJUSTMENTS *(Continued)*

Raking with one side only can be accomplished by leaving the opposite side of the rake in the transport position. Both pins (BFR158 and BFR137) must be placed in the transport lock positions (A and C) respectively on the side of the rake you are not using. This will prevent that side of the rake from opening and the rake wheels from lowering.



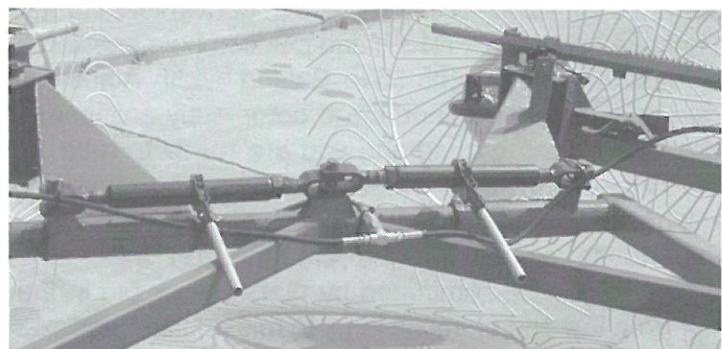
RAKING WIDTH ADJUSTMENTS

There are six raking width adjustments (A) on each bank of rake wheels. As you can set either side in any of the positions (not necessarily both sides in same position) this offers a wide range of raking widths from 24 feet 6 inches to 31 feet 6 inches (16 wheel). Preset rake to proper raking width by pulling spring loaded adjustment lock pin (B) and placing in desired position. Hydraulic cylinders will now open rake to this preset raking width.



WINDROW WIDTHS

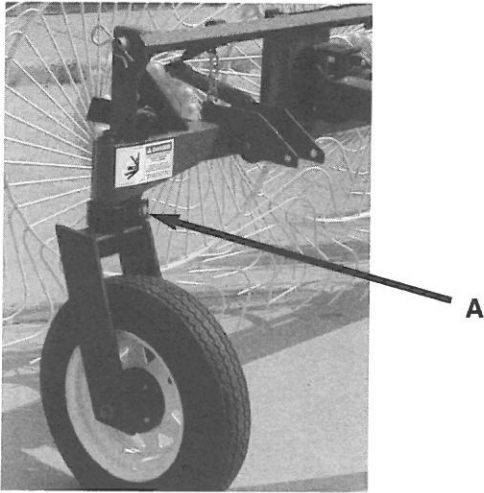
Located at the rear of the rake are two ratchet jack assemblies to adjust windrow width. Each jack controls one side of the rake and can be adjusted independent of the other. This allows for various windrow widths from 33 inches to 60 inches.



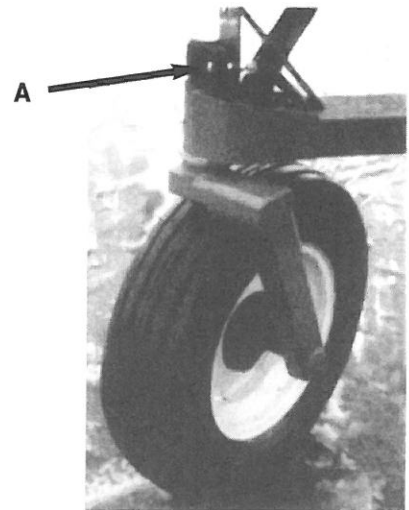
ADJUSTMENTS *(Continued)*

GAUGE WHEELS

Outboard gauge wheels are standard equipment on the twelve and sixteen wheel Deluxe Bi-Fold Rake. These gauge wheels support the rake wheel beams and allow the rake wheels to better follow the contour of the ground. Located on the gauge wheel pivot spindle is an adjustable brake assembly. Adjust brake by tightening bolt (A). Brake should have enough tension to prevent zig-zag motion at raking speeds, but still allow wheel to pivot when making corners.



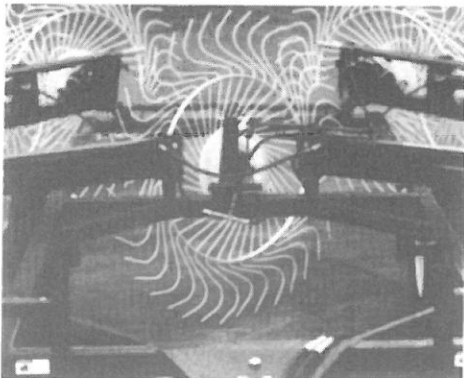
TWELVE WHEEL



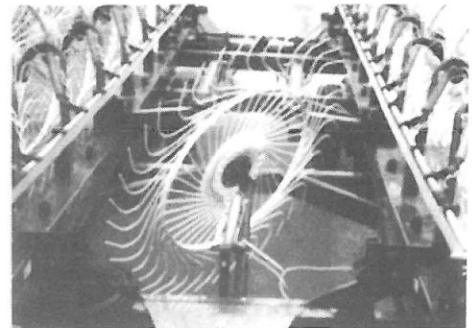
SIXTEEN WHEEL

CENTER KICKER WHEEL

An optional center kicker wheel is available for the Deluxe Bi-Fold Rake. If the hay is laying out flat, this extra wheel allows you to raise the hay laying in the center of the rake out of stubble for easier baler pick-up. Attached to the lift cylinder with a cable, the center kicker wheel will raise and lower when hydraulics are activated to raise and lower left and right hand banks of rake wheels. Kicker wheel may be locked in up position when not needed.



TWELVE WHEEL



SIXTEEN WHEEL

LUBRICATION GUIDE

GREASE FITTINGS

There are thirty-two (twelve wheel) and thirty-six (sixteen wheel) grease fittings on your Deluxe Bi-Fold Rake. Thirty-three (twelve wheel) and thirty-seven (sixteen wheel) grease fittings if equipped with optional center kicker wheel. If these are lubricated properly and often enough it will prolong the life of the Bi-Fold Rake. Grease daily during normal use and before and after storage. Use a good grade of high quality grease. Make sure grease comes out around the shaft on the sleeve type bearings. Wipe off excess grease to prevent accumulation of chaff or grit around the bearings.

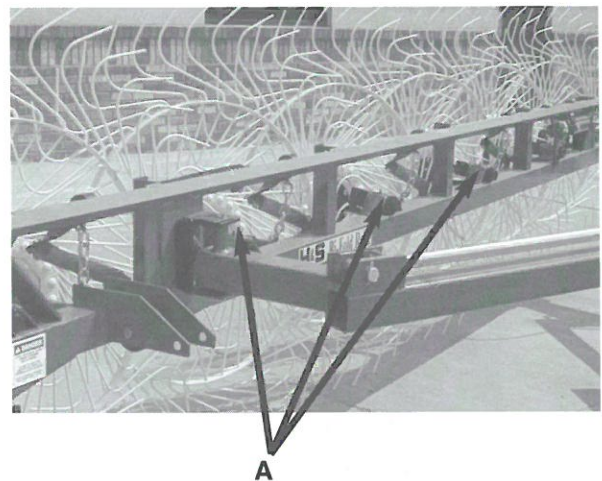
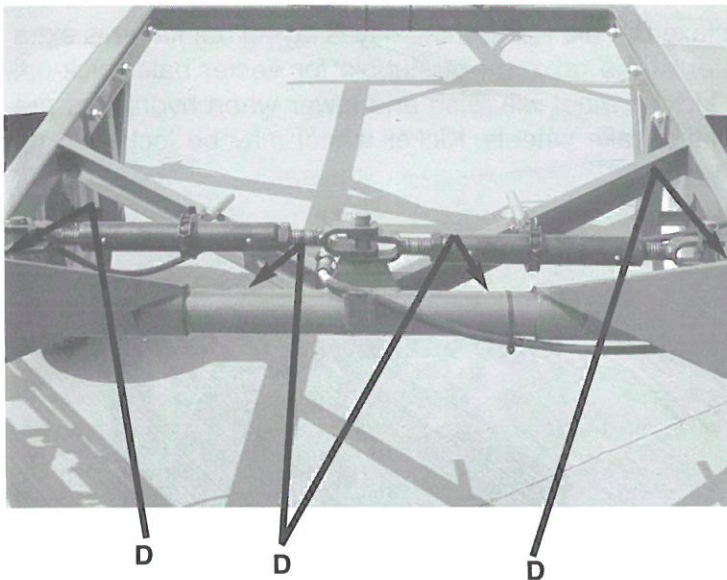
LOCATION

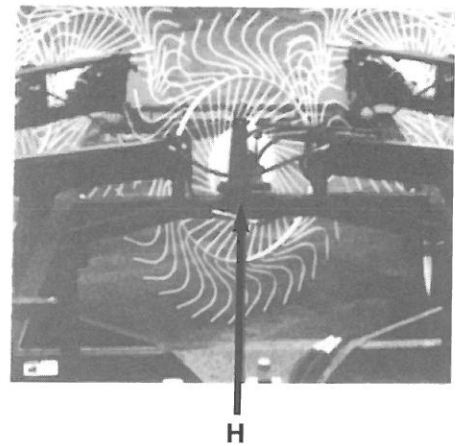
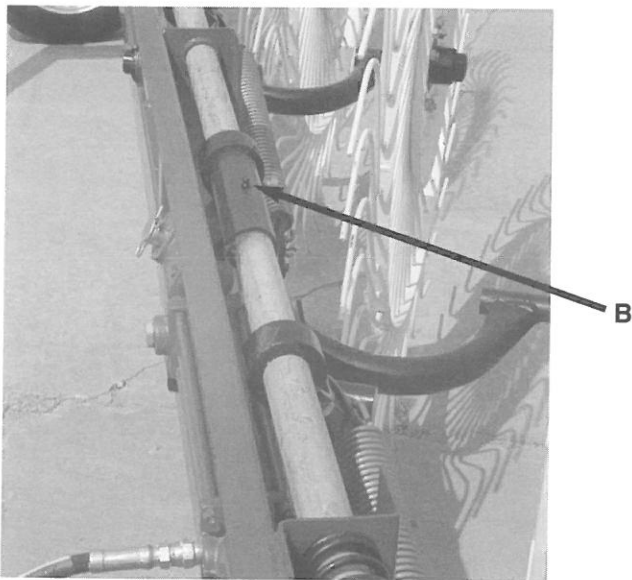
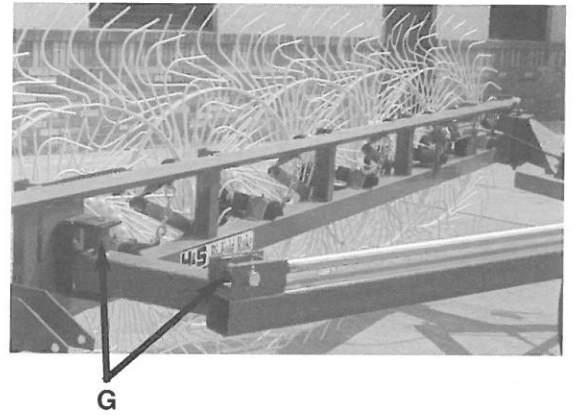
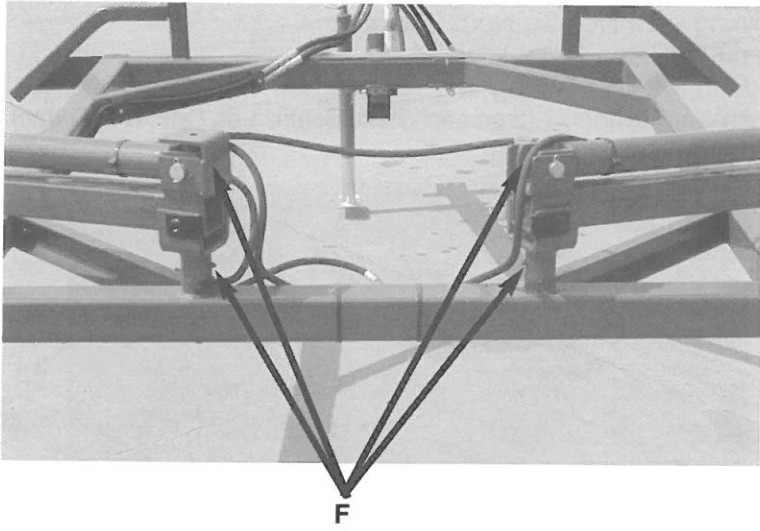
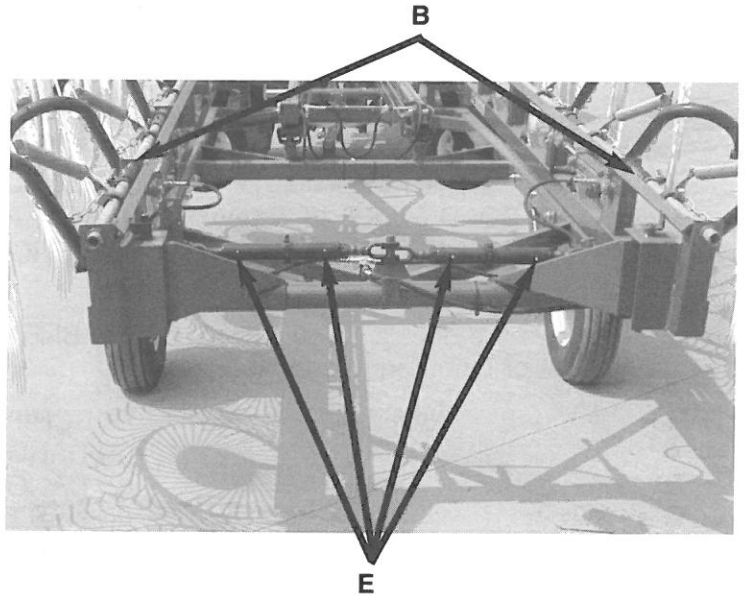
Listed and shown below and on opposite page are the description and location of the grease fittings.

- A. (12) twelve wheel, (16) sixteen wheel, one on each rake wheel arm pivot tube
- B. (2) one on each hydraulic lift bracket
- C. (2) one on each gauge wheel swivel point
- D. (4) two on each rear pivot hinge
- E. (4) two on each windrow adjustment ratchet jack
- F. (4) two on each raking width hydraulic cylinder rear attaching point
- G. (4) two on each front pivot yoke (adjustment arm to rake wheel beam)

OPTIONAL

- H. (1) one on center kicker wheel pivot





DECAL LOCATION

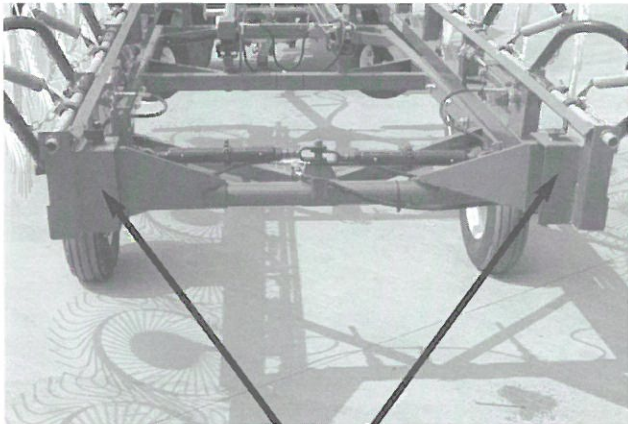
Your H&S Deluxe Bi-Fold Rake was manufactured with operator safety in mind. Located on the Bi-Fold Rake are various decals to aid in operation, and warn of danger or caution areas. Pay close attention to all the decals on your Bi-Fold Rake.



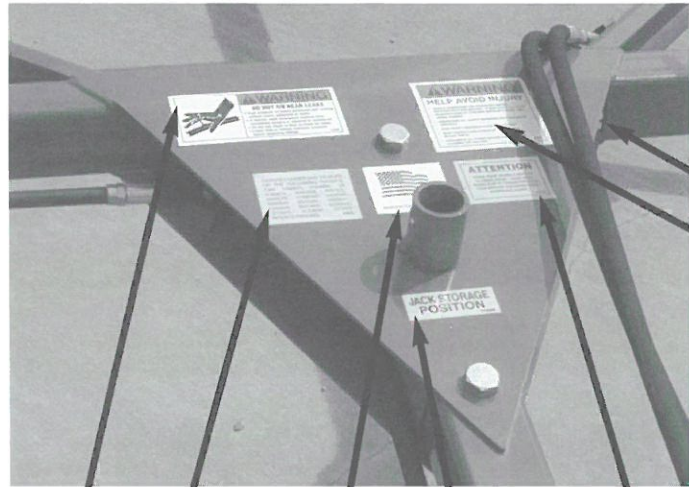
DO NOT REMOVE ANY OF THESE DECALS. IF DECALS ARE LOST, DAMAGED, OR IF BI-FOLD RAKE IS REPAINTED, REPLACE DECALS. REMEMBER; DECALS ARE FOR YOUR PROTECTION AND INFORMATION.

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

ITEM	PART NO.	DESCRIPTION
A	11694A	(2) DANGER - Stay Clear
B	11694B	(2) DANGER - Stay Clear
C		(4) H&S Bi-Fold Rake (Only 2 on 16 wheel)
D	72203A	Warning - Help Avoid Injury
E	71188B	Jack Storage
F		Serial Number
G	H&S	Patent Numbers
H		(2) Red Reflector
I	11599	Warning - Do Not Go Near Leaks
J	12197A	Attention: Raise Rake Wheels
K		Made in the USA - Flag
L	13004D	(5) Amber Reflector (2 on each Rake Beam, 1 on Left Front Frame) Complete Set of Decals



H



I

G

K

E

J

F

D



A

L

C

B

INSTRUCTIONS FOR ORDERING PARTS

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

1. Model & Serial Number - Both can be located on the front main frame cross tubing, left side of hitch.
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)

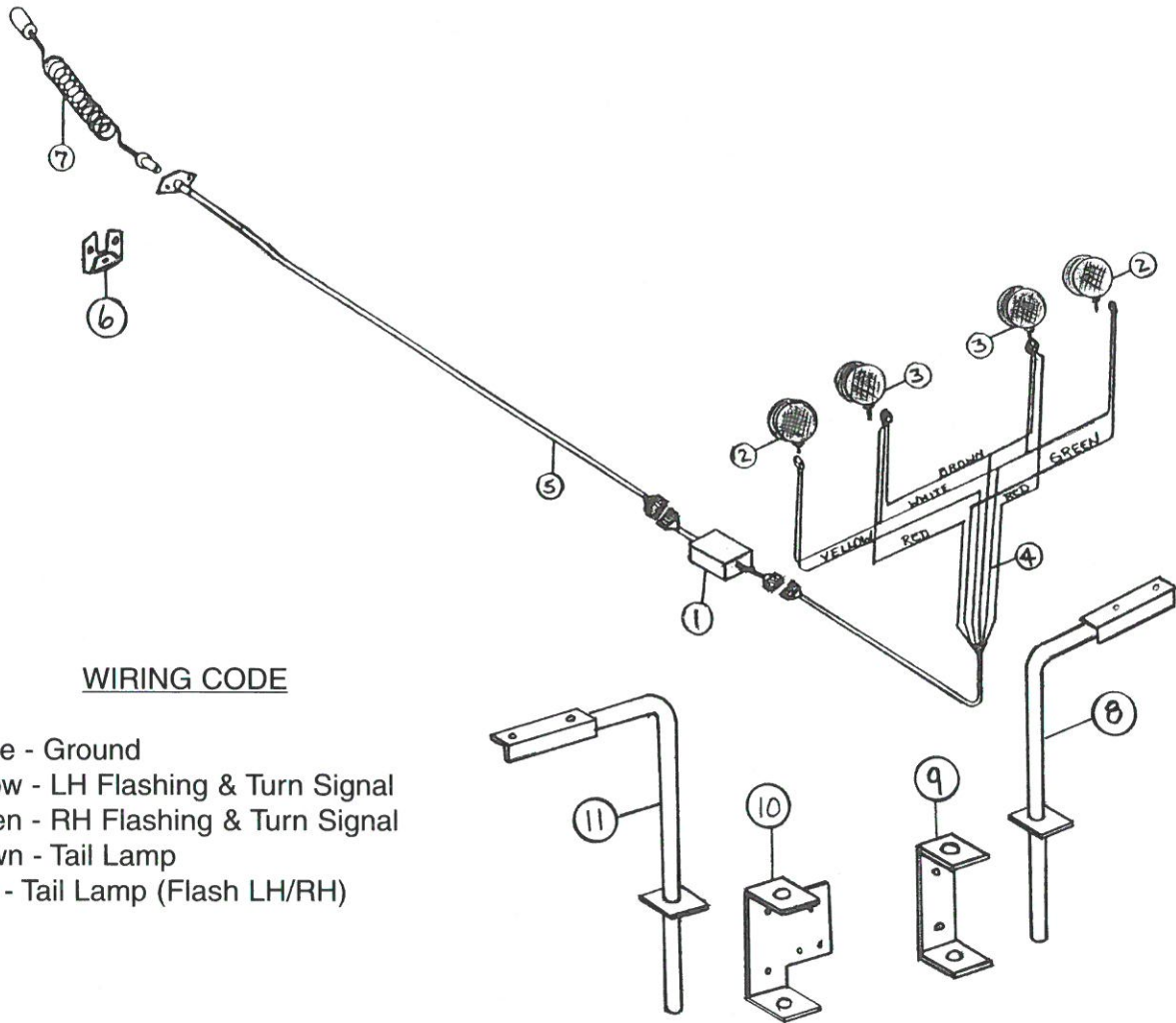
H&S MFG. CO. INC.	
MARSHFIELD, WIS.	
MOD. NO.	<input type="text"/>
SER. NO.	<input type="text"/>
DESCR.	<input type="text"/>

PLEASE RECORD NUMBERS FOR YOUR UNIT FOR QUICK REFERENCE

ABOUT IMPROVEMENTS

H&S IS CONTINUALLY STRIVING TO IMPROVE ITS' 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.



WIRING CODE

White - Ground
 Yellow - LH Flashing & Turn Signal
 Green - RH Flashing & Turn Signal
 Brown - Tail Lamp
 Red - Tail Lamp (Flash LH/RH)

OPTIONAL RAKE LIGHTING DIAGRAM

ITEM	PART NO.	DESCRIPTION
1.	S441	Light Module
2.	DWM129	Amber Light
3.	BFR675	Red Light
4.	BFR695	Light Harness (6 WIRE)
5.	BFR687	8 Wheel Light Harness
*	BFR688	12 Wheel Light Harness
*	BFR669	16 Wheel Light Harness
6.	BFR659	Mounting Bracket
7.	S317	Optional Tractor Cord
8.	BFR686	Right Rear Light Arm
9.	BFR683	Mounting Bracket RH
10.	BFR684	Mounting Bracket LH
11.	BFR685	Left Rear Light Arm
*	BFR690	8 Wheel Deluxe Comp. Light Harness Less Optional Tractor Cord
*	BFR691	12 Wheel Deluxe Comp. Light Harness Less Optional Tractor Cord
*	BFR692	16 Wheel Deluxe Comp. Light Harness Less Optional Tractor Cord

NOTE: * (Means Not Shown)

- SERVICE NOTES -

Lined area for service notes, consisting of multiple horizontal lines for writing.

FIGURE 1

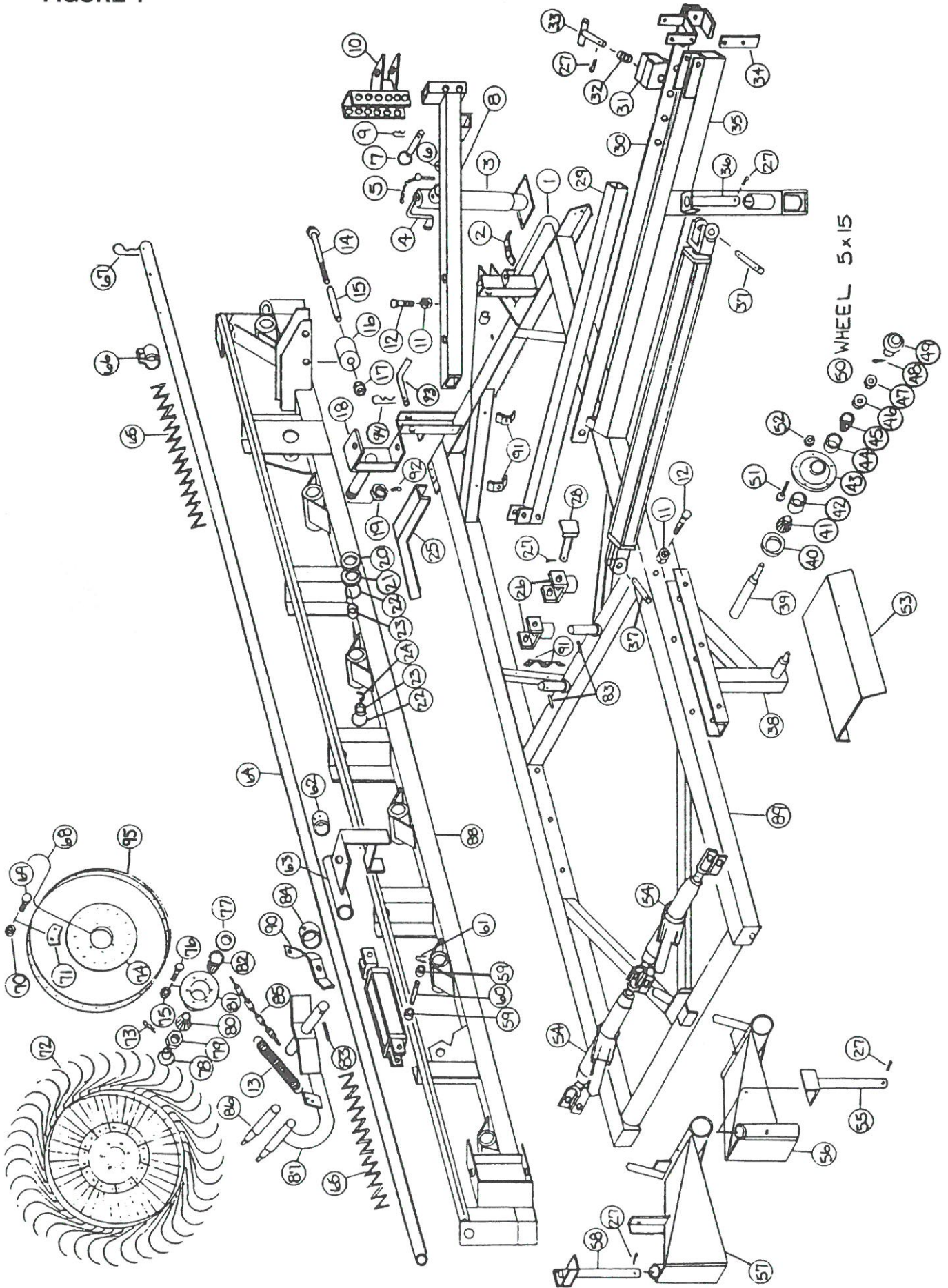


FIGURE 1
H&S 12 WHEEL DELUXE BI-FOLD RAKE
MAIN FRAME

ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1.	BFR222	Hydraulic Pipe	51.	BFR143	Stud Bolt
2.	23N67	Hose Clamp	52.	BFR144	Nut
3.	12N11	Jack	53.	BFR134	Fender RH
4.	12N12	Jack Handle	*	BFR135	Fender LH
5.	12N13	Jack Pin & Chain	54.	T138	Ratchet Jack
6.	12N14	Jack Mount	*	T139	Ratchet Jack Handle
7.	BFR5	Hitch Pin	*	T140	Ratchet Jack Pawl
8.	BFR676	Pole	*	T141	Ratchet Jack Spring
9.	BFR7	Hair Pin	55.	BFR248	RH Hinge Pin
10.	BFR129	Hitch	56.	BFR249	RH Beam Hinge
11.	HE7	Lock Nut	57.	BFR250	LH Beam Hinge
12.	HE6	3/4" x 4-1/2" Bolt GR.5	58.	BFR251	LH Hinge Pin
13.	BFR138	Spring	59.	BFR47	Spacer
14.	BFR224	1/2" x 4-1/2" Bolt GR.5	60.	T143	Hydraulic Cylinder Pin
15.	BFR225	Roller Axle	61.	T144	Clip Pin
16.	BFR226	Poly Roller	62.	BFR83	Hydraulic Lift Clamp
17.	R29	1/2" Nut	63.	BFR39	LH Hydraulic Lift Bracket
18.	BFR227	Front Yoke	*	BFR40	RH Hydraulic Lift Bracket
19.	BFR228	1-1/4" Slotted Nut	64.	BFR130	Lifting Pipe
20.	BFR229	Steel Washer	65.	BFR84	Compression Spring
21.	BFR221	Poly Washer	66.	BFR34	Pipe Clamp
22.	S99	"O" Ring	67.	BFR694	Hair Pin
23.	G16	Bushing	68.	T176	Rake Wheel Tooth
24.	BFR230	Spacer	69.	T175	10mm x 25mm Carriage Bolt
25.	BFR231	Ramp LH	70.	BFR652	10mm Lock Nut
*	BFR232	Ramp RH	71.	T178	Rake Tooth Clip
26.	BFR233	Back Cylinder Mount	72.	T174	LH Rake Wheel
27.	T72	5/32" x 1-1/2" Center Pin	*	BFR31	RH Rake Wheel
28.	BFR234	Back Cylinder Pin	73.	T169	Cotter Pin
29.	BFR235	RH Inner Sleeve	74.	T179	Rake Wheel Center
*	BFR236	LH Inner Sleeve	75.	T166	10mm Nut
30.	BFR237	Sleeve Adjustable Bar RH	76.	T168	10mm x 25mm Bolt
*	BFR238	Sleeve Adjustable Bar LH	77.	T163	Seal
31.	BFR239	Sleeve Adjustable Lock	78.	T173	Hub Cap
32.	BFR240	Spring	79.	T172	Nut
33.	BFR241	Adjustment Handle	80.	T170	Outer Bearing
34.	BFR242	Cylinder Holder Clamp	*	T171	Outer Race
35.	BFR680	RH Outer Sleeve	81.	BFR32	Rake Wheel Hub
*	BFR681	LH Outer Sleeve	82.	T164	Inner Bearing
36.	BFR245	Outer Sleeve Pin	*	T165	Inner Race
37.	BFR246	Cylinder Pin	83.	3G22	Roll Pin
38.	BFR141	RH Axle Assembly	84.	BFR82	Pipe Clamp
*	BFR142	LH Axle Assembly	85.	BFR140	Chain
39.	BFR56	Spindle	86.	BFR36	Rake Wheel Spindle
40.	BFR57	Seal	87.	BFR265A	Rake Arm LH
41.	BFR58	Inner Bearing	*	BFR266A	Rake Arm RH
42.	BFR59	Inner Race	88.	BFR252	Rake Beam LH
43.	BFR60	Hub	*	BFR253	Rake Beam RH
44.	BFR61	Outer Race	89.	BFR254	Main Frame
45.	BFR62	Outer Bearing	90.	BFR255	Spring Bracket LH
46.	BFR63	Washer	*	BFR256	Spring Bracket RH
47.	BFR64	Nut	91.	BFR257	Hose Clamp
48.	BFR65	Cotter Pin	92.	T56	5/32" x 2" Cotter Pin
49.	BFR66	Hub Cap	93.	BFR158	Lock Pin
50.	BFR67	Wheel 5 x 15	94.	ES7	Hair Pin
			95.	T177	Outer Ring

NOTE: * (Means Not Shown)

FIGURE 2

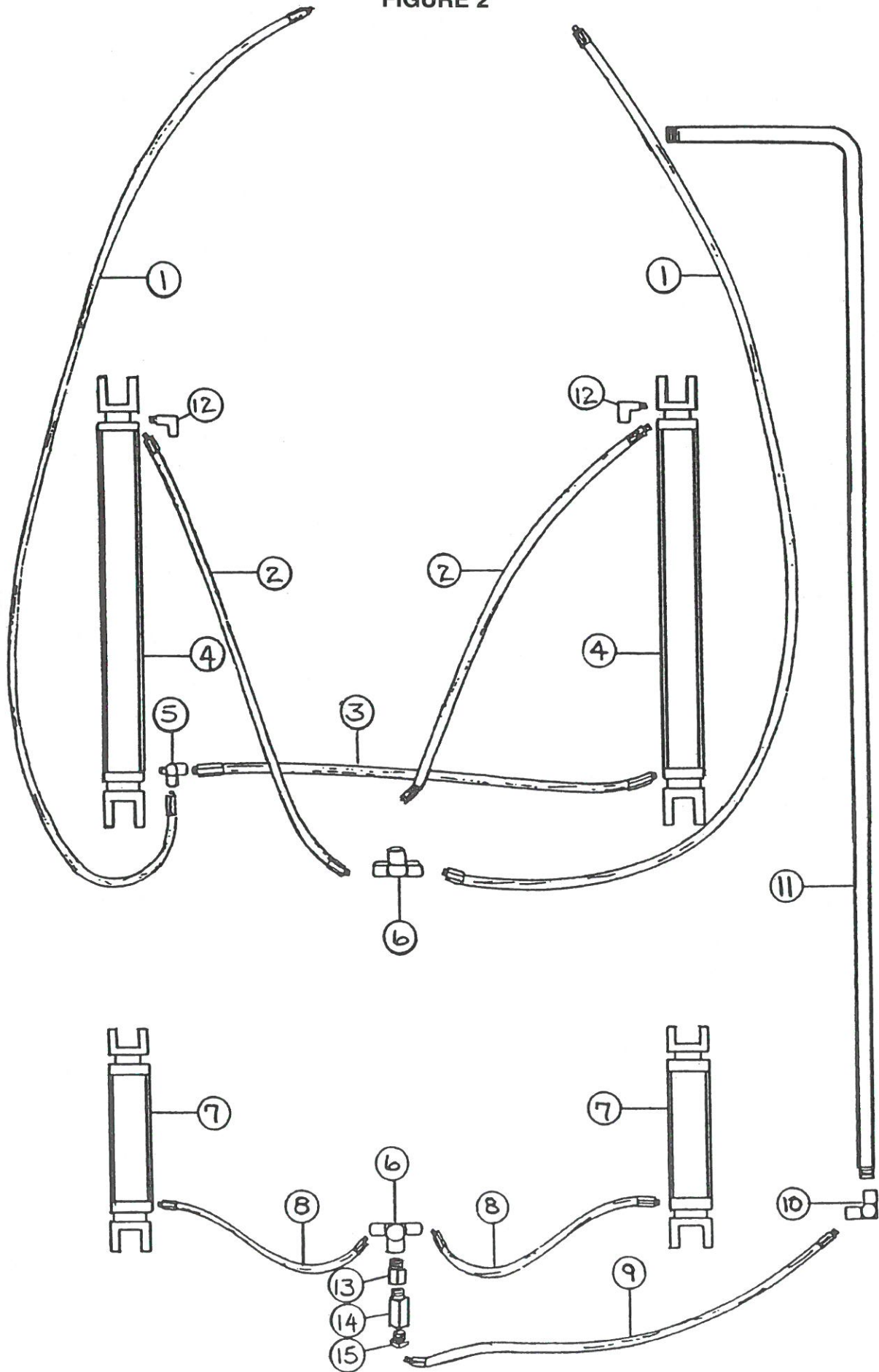
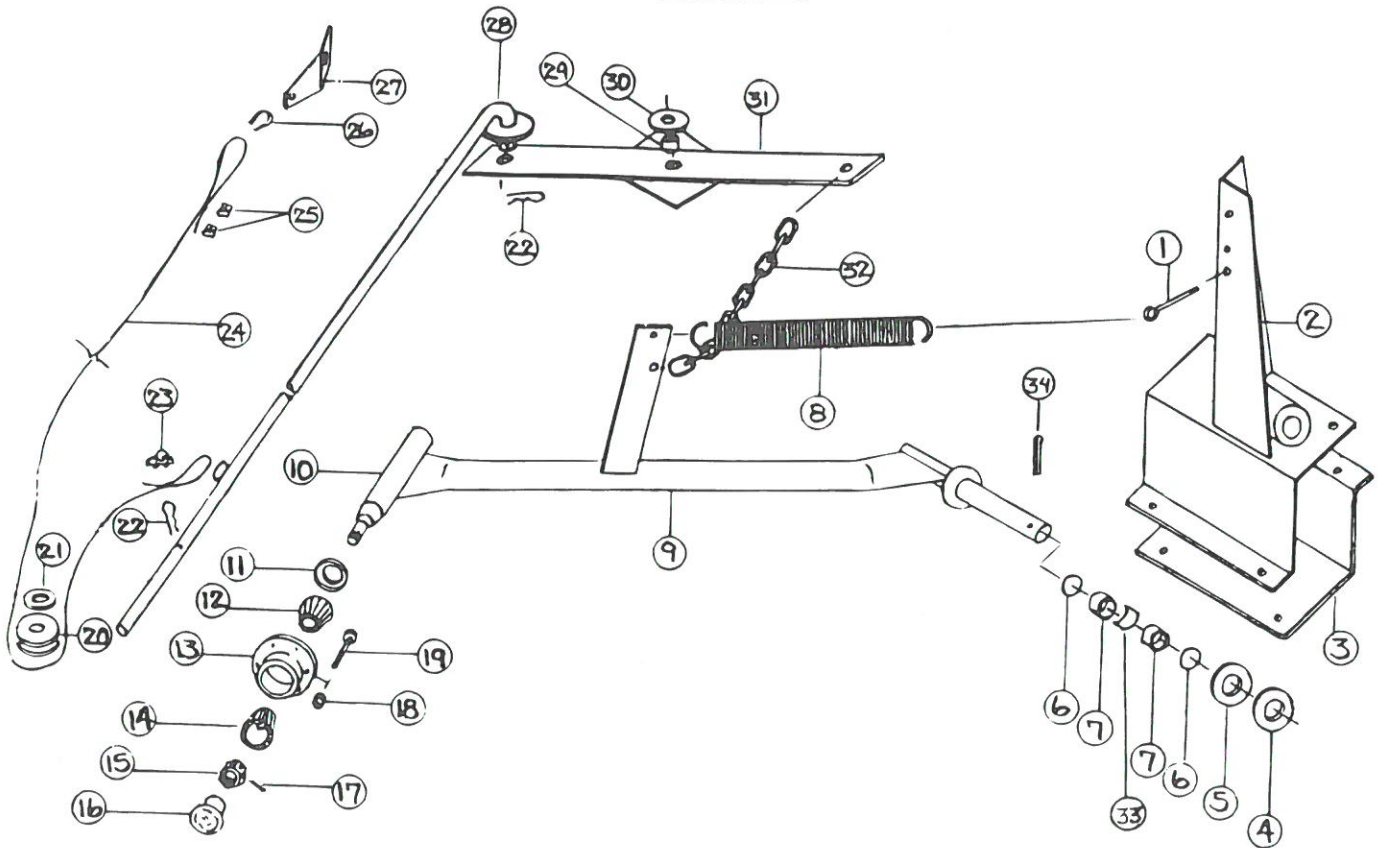


FIGURE 2
H&S 12 WHEEL DELUXE BI-FOLD RAKE
HYDRAULICS

ITEM	PART NO.	DESCRIPTION
1.	BFR284	96" Hydraulic Hose
2.	BFR285	72" Hydraulic Hose
3.	BFR286	30" Hydraulic Hose
4.	BFR288A	Hydraulic Open Cylinders 48"
5.	23N116	Tee
6.	BFR74	3/8" Female Tee
7.	BFR69A	Hydraulic Lift Cylinders
8.	BFR46	48" Hydraulic Hose
9.	BFR287	36" Hydraulic Hose
10.	HE59	3/8" Female Elbow
11.	BFR222	Hydraulic Pipe
12.	23N234	3/8" Street Elbow
13.	BFR555	Adapter
14.	BFR554	Flow Valve
15.	JB82	Bushing 3/8" to 1/2"

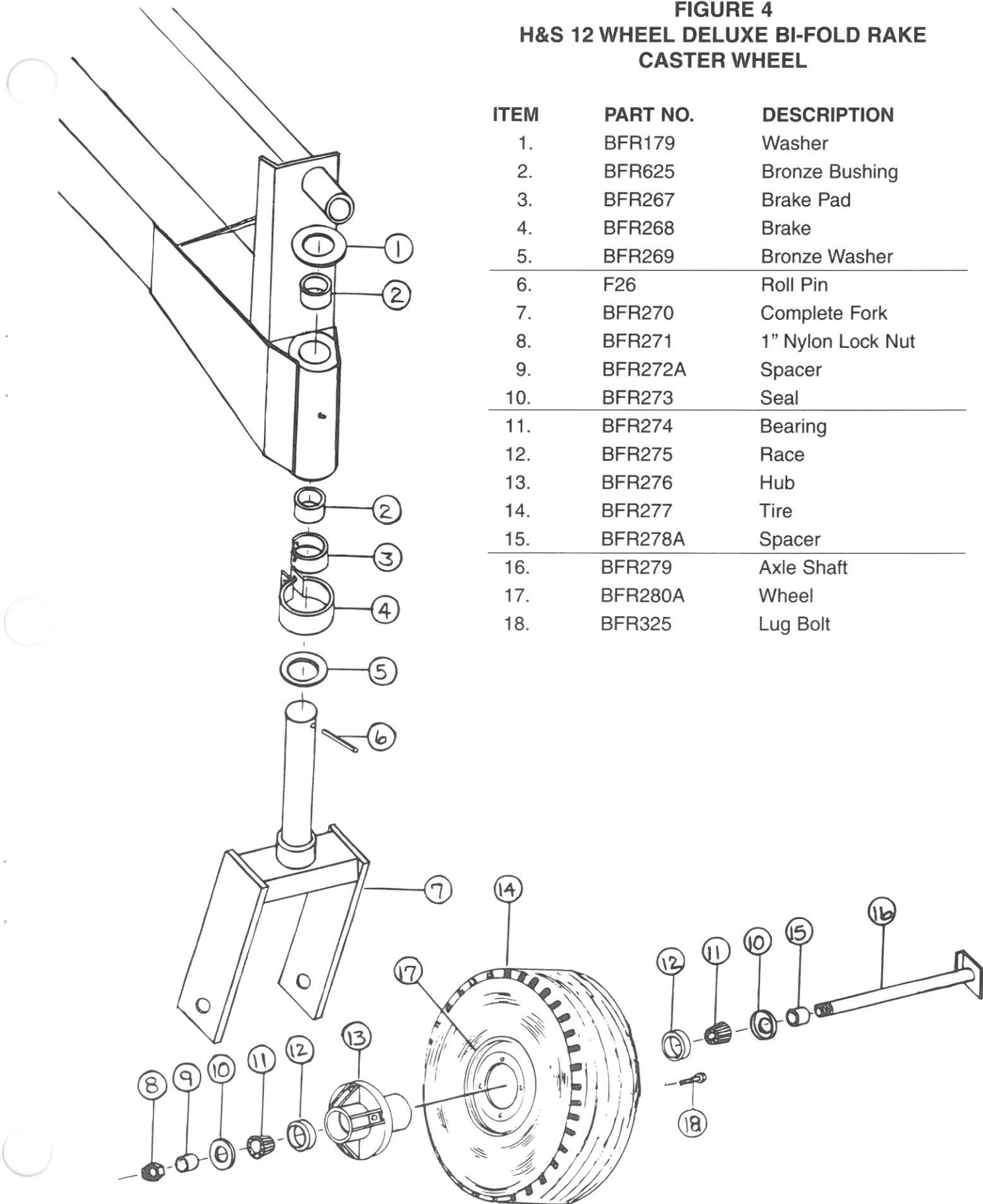
FIGURE 3



**H&S 12 WHEEL DELUXE BI-FOLD RAKE
KICKER WHEEL**

ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1.	ES10	"I" Bolt	17.	T169	Cotter Pin
2.	BFR214	Lift Tower	18.	T166	10mm Nut
3.	BFR113	Bottom Bracket	19.	T168	10mm x 25mm Bolt
4.	BFR229	Steel Washer	20.	BFR292	Poly Pulley
5.	BFR221	Poly Washer	21.	T73	Washer
6.	S99	"O" Ring	22.	ES7	Hair Pin
7.	G16	Bushing	23.	BFR220	Cable Clamp
8.	BFR138	Spring	24.	BFR219	Cable
9.	BFR215	Kicker Arm	25.	ES15	Sleeve
10.	BFR36	Spindle	26.	ES14	Thimble
11.	T163	Seal	27.	BFR281	Cable End Bracket
12.	T164	Inner Bearing	28.	BFR218	Lifting Rod
*	T165	Inner Race	29.	BFR282	Bell Crank Spacer
13.	BFR32	Rake Wheel Hub	30.	BFR217	Bell Crank Washer
14.	T170	Outer Bearing	31.	BFR216	Bell Crank
*	T171	Outer Race	32.	BFR140	Kicker Arm Chain
15.	T172	Nut	33.	BFR230	Spacer
16.	T173	Hub Cap	34.	3G22	Roll Pin
		NOTE: * (Means Not Shown)	*	BFR31	Rake Wheel RH

FIGURE 4
H&S 12 WHEEL DELUXE BI-FOLD RAKE
CASTER WHEEL



ITEM	PART NO.	DESCRIPTION
1.	BFR179	Washer
2.	BFR625	Bronze Bushing
3.	BFR267	Brake Pad
4.	BFR268	Brake
5.	BFR269	Bronze Washer
6.	F26	Roll Pin
7.	BFR270	Complete Fork
8.	BFR271	1" Nylon Lock Nut
9.	BFR272A	Spacer
10.	BFR273	Seal
11.	BFR274	Bearing
12.	BFR275	Race
13.	BFR276	Hub
14.	BFR277	Tire
15.	BFR278A	Spacer
16.	BFR279	Axle Shaft
17.	BFR280A	Wheel
18.	BFR325	Lug Bolt

FIGURE 5

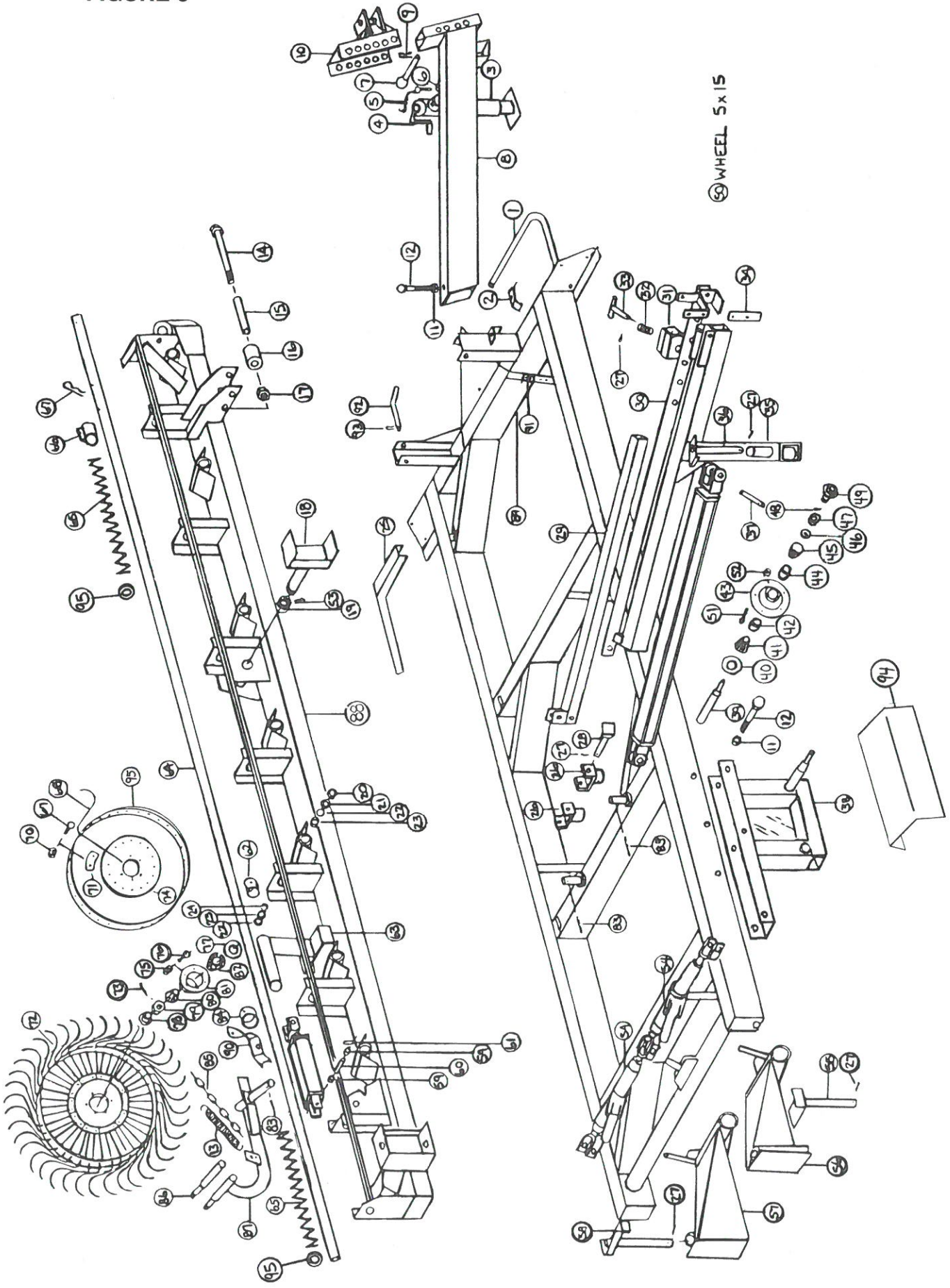


FIGURE 5
H&S 16 WHEEL DELUXE BI-FOLD RAKE
MAIN FRAME

ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1.	BFR155	Hydraulic Pipe	50.	BFR67	Wheel 5 x 15
2.	23N67	Hose Clamp	51.	BFR143	Stud Bolt
3.	12N11	Jack	52.	BFR144	Nut
4.	12N12	Jack Handle	53.	T56	5/32" x 2" Cotter Pin
5.	12N13	Jack Pin & Chain	54.	T138	Ratchet Jack
6.	12N14	Jack Mount	*	T139	Ratchet Jack Handle
7.	BFR5	Hitch Pin	*	T140	Ratchet Jack Pawl
8.	BFR677	Pole	*	T141	Ratchet Jack Spring
9.	BFR7	Hair Pin	55.	BFR300	RH Hinge Pin
10.	BFR157	Hitch	56.	BFR301	RH Beam Hinge
11.	HE7	Lock Nut	57.	BFR302	LH Beam Hinge
12.	BFR50	3/4" x 7" Bolt GR.5	58.	BFR303	LH Hinge Pin
13.	BFR138	Spring	59.	BFR47	Spacer
14.	BFR224	1/2" x 4-1/2" Bolt GR.5	60.	T143	Hydraulic Cylinder Pin
15.	BFR225	Roller Axle	61.	T144	Clip Pin
16.	BFR226	Poly Roller	62.	BFR83	Hydraulic Lift Clamp
17.	R29	1/2" Nut	63.	BFR304	LH Hydraulic Lift Bracket
18.	BFR227	Front Yoke	*	BFR305	RH Hydraulic Lift Bracket
19.	BFR228	1-1/4" Slotted Nut	64.	BFR163	Lifting Pipe
20.	BFR229	Steel Washer	65.	BFR84	Compression Spring
21.	BFR221	Poly Washer	66.	BFR34	Pipe Clamp
22.	S99	"O" Ring	67.	BFR694	Hair Pin
23.	G16	Bushing	68.	T176	Rake Wheel Tooth
24.	BFR230	Spacer	69.	T175	10mm x 25mm Carriage Bolt
25.	BFR298	Ramp LH	70.	BFR652	10mm Lock Nut
*	BFR299	Ramp RH	71.	T178	Rake Tooth Clip
26.	BFR233	Back Cylinder Mount	72.	T174	LH Rake Wheel
27.	T72	5/32" x 1-1/2" Center Pin	*	BFR31	RH Rake Wheel
28.	BFR234	Back Cylinder Pin	73.	T169	Cotter Pin
29.	BFR235	RH Inner Sleeve	74.	T179	Rake Wheel Center
*	BFR236	LH Inner Sleeve	75.	T166	10mm Nut
30.	BFR237	Sleeve Adjustable Bar RH	76.	T168	10mm x 25mm Bolt
*	BFR238	Sleeve Adjustable Bar LH	77.	T163	Seal
31.	BFR239	Sleeve Adjustable Lock	78.	T173	Hub Cap
32.	BFR240	Spring	79.	T172	Nut
33.	BFR241	Adjustment Handle	80.	T170	Outer Bearing
34.	BFR242	Cylinder Holder Clamp	*	T171	Outer Race
35.	BFR678	RH Outer Sleeve	81.	BFR32	Rake Wheel Hub
*	BFR679	LH Outer Sleeve	82.	T164	Inner Bearing
36.	BFR245	Outer Sleeve Pin	*	T165	Inner Race
37.	BFR246	Cylinder Pin	83.	3G22	Roll Pin
38.	BFR647	RH Axle Assembly	84.	BFR82	Pipe Clamp
*	BFR648	LH Axle Assembly	85.	BFR140	Chain
39.	BFR56	Spindle	86.	BFR36	Rake Wheel Spindle
40.	BFR57	Seal	87.	BFR265A	Rake Arm LH
41.	BFR58	Inner Bearing	*	BFR266A	Rake Arm RH
42.	BFR59	Inner Race	88.	BFR306	Rake Beam LH
43.	BFR60	Hub	*	BFR307	Rake Beam RH
44.	BFR61	Outer Race	89.	BFR308	Main Frame
45.	BFR62	Outer Bearing	90.	BFR255	Spring Bracket LH
46.	BFR63	Washer	*	BFR256	Spring Bracket RH
47.	BFR64	Nut	91.	BFR257	Hose Clamp
48.	BFR65	Cotter Pin	92.	BFR158	Lock Pin
49.	BFR66	Hub Cap	93.	ES7	Hair Pin
	NOTE: * (Means Not Shown)		94.	BFR646	Fender
			95.	T177	Outer Ring

FIGURE 6

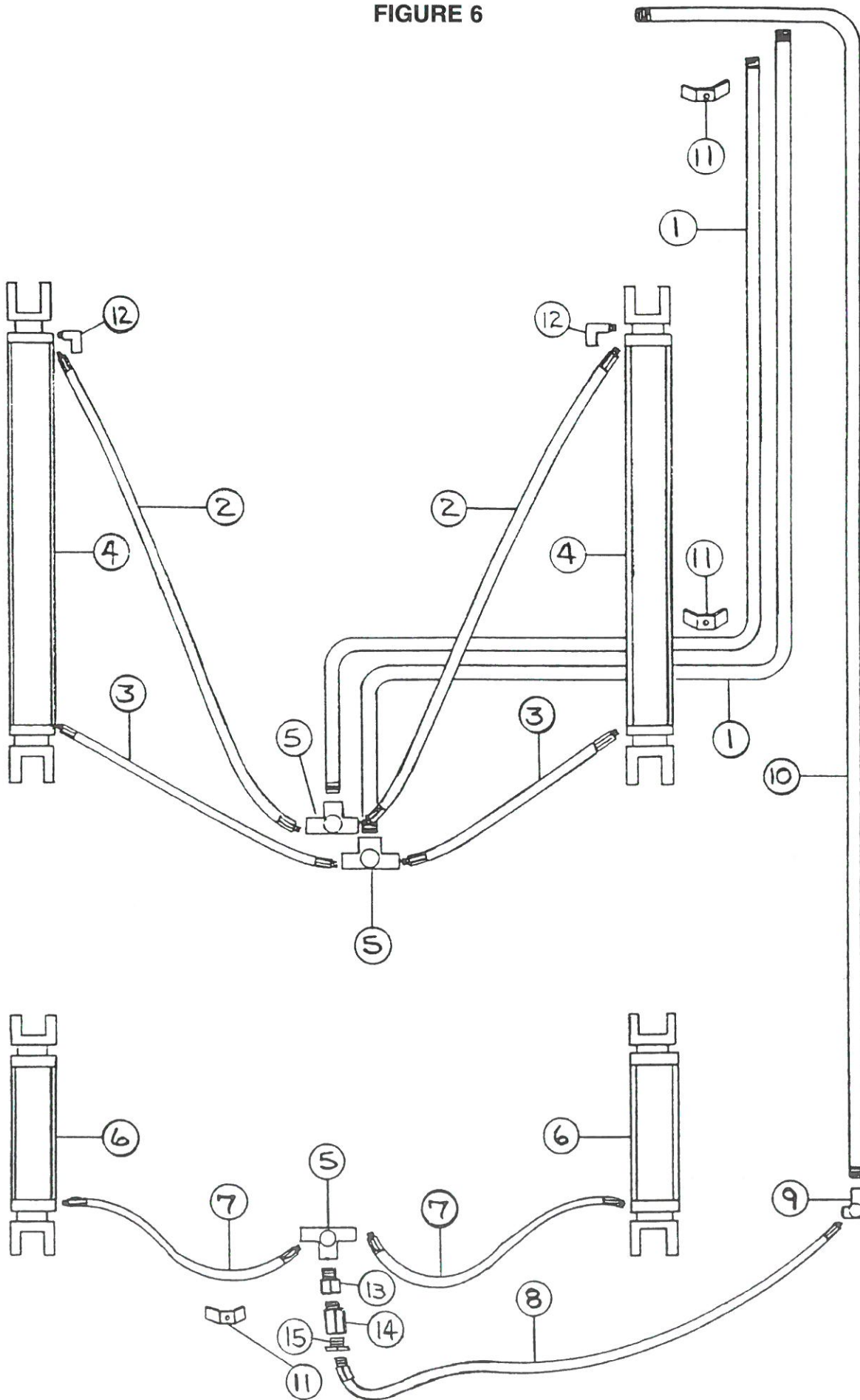


FIGURE 6
H&S 16 WHEEL DELUXE BI-FOLD RAKE
HYDRAULICS

ITEM	PART NO.	DESCRIPTION
1.	BFR314	Hydraulic Open Pipe
2.	BFR285	72" Hydraulic Hose
3.	BFR315	20" Hydraulic Hose
4.	BFR288A	Hydraulic Open Cylinders 48"
5.	BFR74	3/8" Female Tee
6.	BFR69A	Hydraulic Lift Cylinder
7.	BFR46	48" Hydraulic Hose
8.	BFR507	44" Hydraulic Hose
9.	HE59	3/8" Female Elbow
10.	BFR155	Hydraulic Lift Pipe
11.	BFR257	Hose Clamp
12.	23N234	3/8" Street Elbow
13.	BFR555	Adapter
14.	BFR554	Flow Valve
15.	JB82	Bushing 3/8" to 1/2"

FIGURE 7

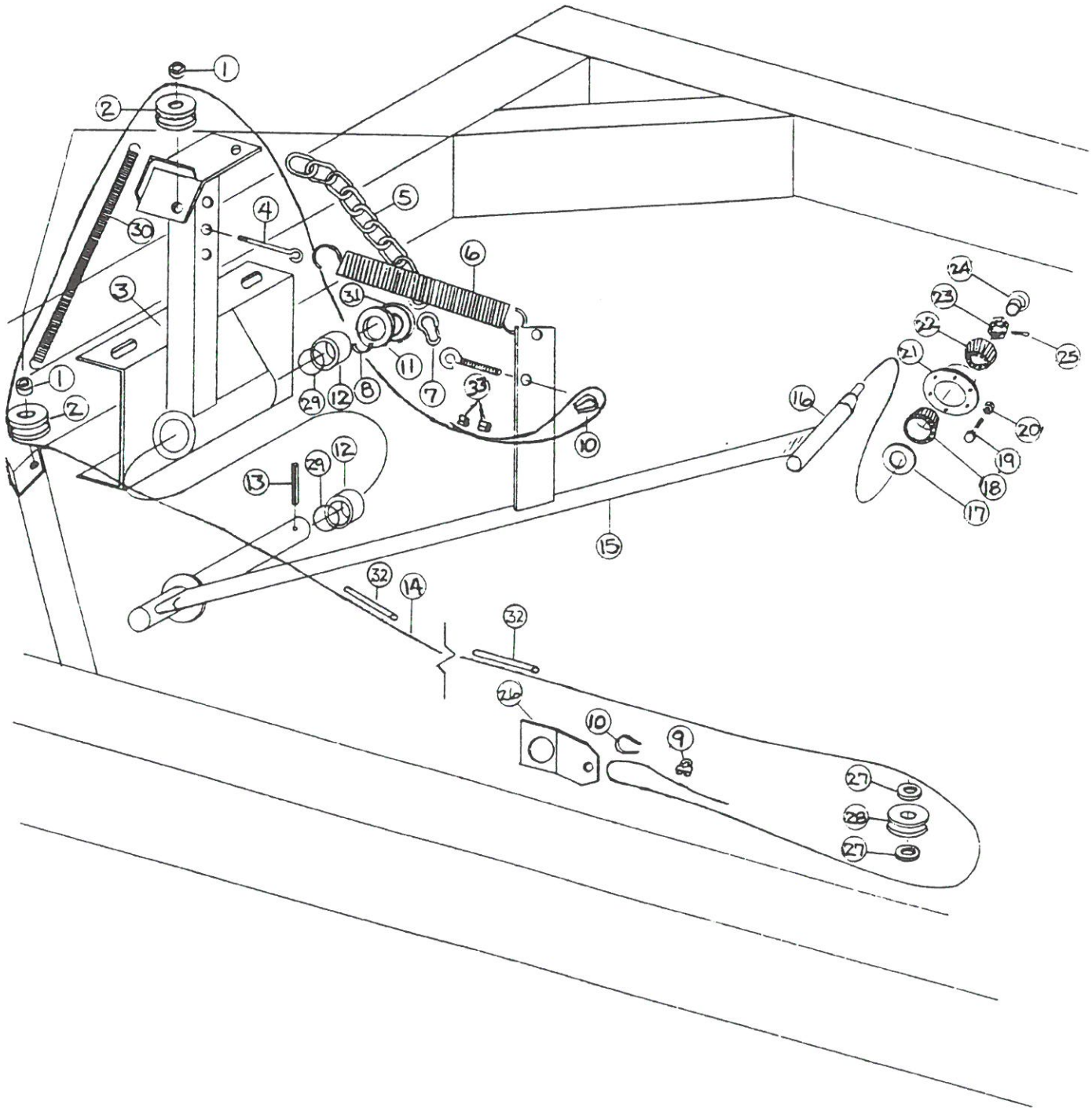
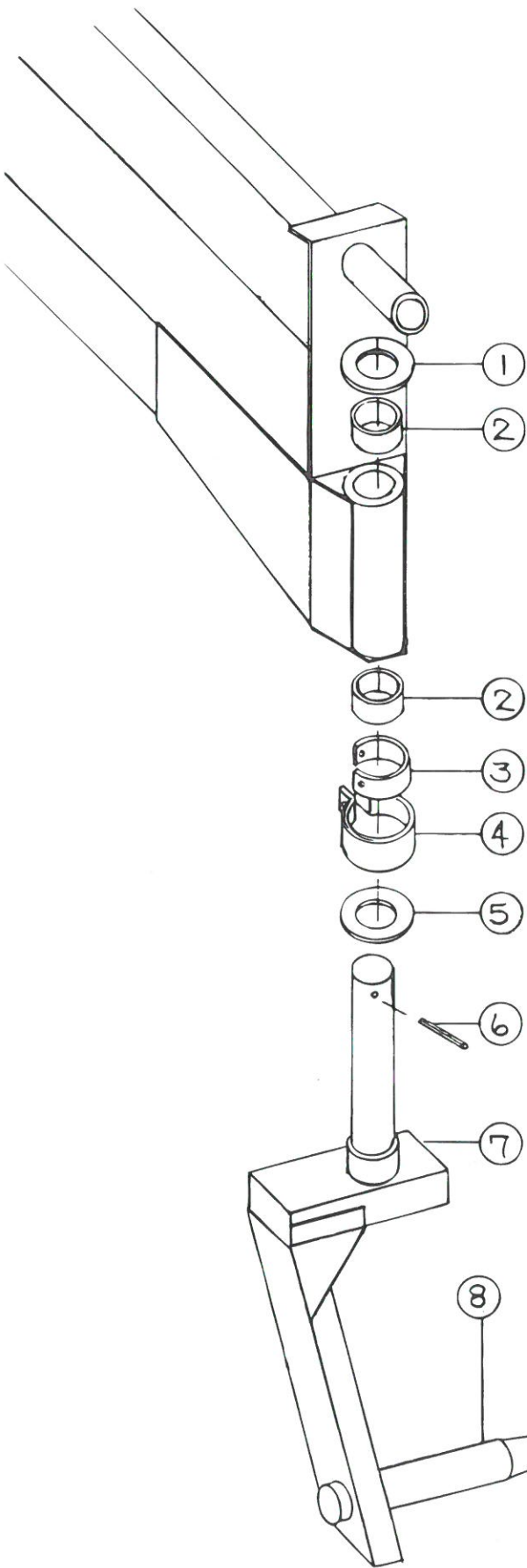


FIGURE 7
H&S 16 WHEEL DELUXE BI-FOLD RAKE
OPTIONAL KICKER WHEEL

ITEM	PART NO.	DESCRIPTION
1.	ST81	Spacer
2.	BFR292	Poly Pulley
3.	BFR293	Lift Tower
4.	ES10	"I" Bolt
5.	BFR294	Kicker Arm Chain
6.	BFR138	Spring
7.	BFR295	Snap Hook
8.	BFR230	Spacer
9.	BFR220	Cable Clamp
10.	ES14	Thimble
11.	BFR221	Poly Washer
12.	G16	Bushing
13.	3G22	Roll Pin
14.	BFR296	Cable
15.	BFR215	Kicker Arm
16.	BFR36	Spindle
17.	T163	Seal
18.	T164	Inner Bearing
*	T165	Inner Race
19.	T168	10mm x 25mm Bolt
20.	T166	10mm Nut
21.	BFR32	Rake Wheel Hub
22.	T170	Outer Bearing
*	T171	Outer Race
23.	T172	Nut
24.	T173	Hub Cap
25.	T169	Cotter Pin
26.	BFR281	Cable End Bracket
27.	BFR33	Washer
28.	BFR283	Poly Pulley
29.	S99	"O" Ring
30.	23N187	Spring
31.	BFR229	Steel Washer
32.	BFR317	Plastic Cable Guard Hose
*	BFR31	Rake Wheel RH
33.	ES5	Cable Clamp (crimped)

NOTE: * (Means Not Shown)

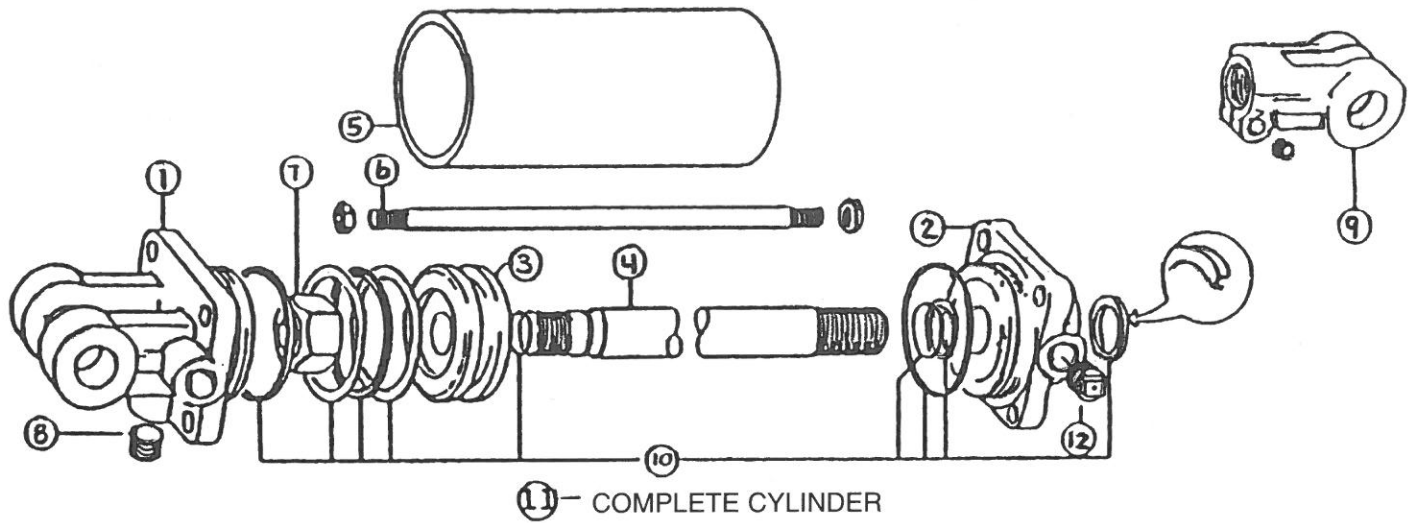
FIGURE 8
H&S 16 WHEEL DELUXE BI-FOLD RAKE
CASTER WHEEL



ITEM	PART NO.	DESCRIPTION
1.	BFR309	Gauge Wheel Washer
2.	BFR527	Bronze Bushing
3.	BFR310	Brake Pad
4.	BFR311	Brake Collar
5.	RG24	Bronze Washer
6.	BFR313	Roll Pin 5/16" x 2-3/4"
7.	BFR312	Complete Fork RH
*	BFR316	Complete Fork LH
8.	BFR56	Spindle
9.	BFR57	Seal
10.	BFR58	Inner Bearing
11.	BFR143	Stud Bolt
12.	BFR60	Hub
13.	BFR144	Nut
14.	BFR62	Outer Bearing
15.	BFR63	Washer
16.	BFR65	Cotter Pin
17.	BFR66	Hub Cap
18.	BFR59	Inner Race
19.	BFR61	Outer Race
20.	BFR64	Nut
21.	BFR67	Wheel 5 x 15

②① WHEEL 5 x 15

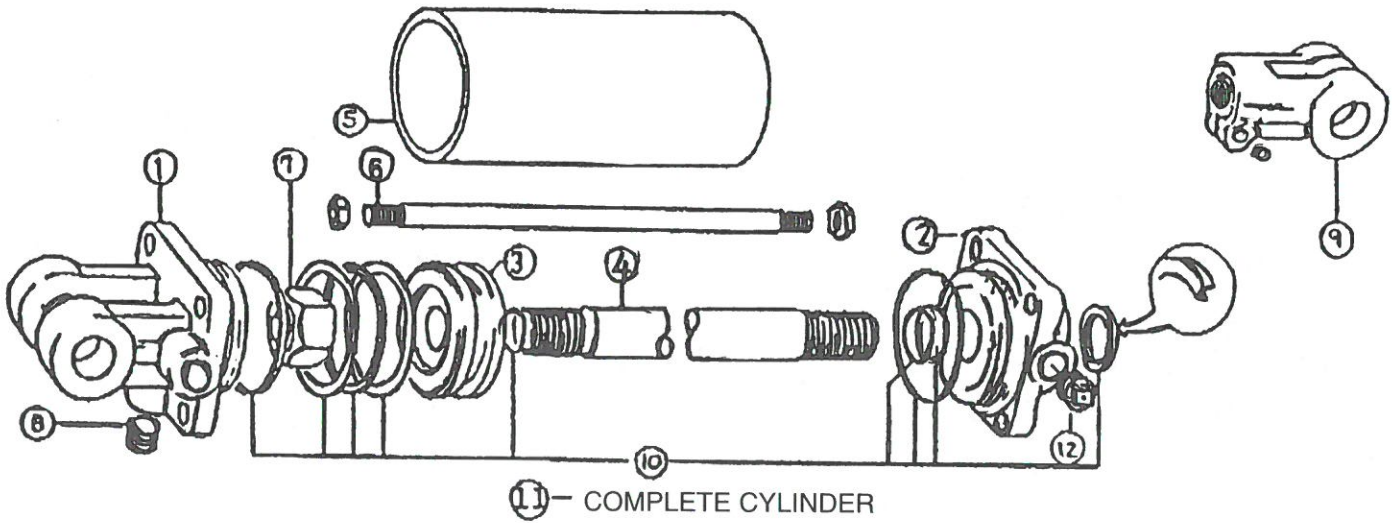
FIGURE 9



**H&S 16 WHEEL DELUXE BI-FOLD RAKE
HYDRAULIC LIFT CYLINDER**

ITEM	PART NO.	DESCRIPTION
1.	23N142A	Clevis Cap
2.	23N143A	Rod Cap
3.	23N144	Piston
4.	T184A	Rod
5.	BFR68	Cylinder Tube
6.	T186	Tie Rod
7.	23N148	Piston Nut
8.	23N149	Plug
9.	23N150A	Rod Clevis
10.	23N151	Seal Kit
11.	BFR69A	Complete Cylinder
12.	BFR70	Vent Plug

**FIGURE 10
OPENING CYLINDER**



**H&S 12 WHEEL DELUXE BI-FOLD RAKE
16 WHEEL DELUXE RAKE (2004 & Newer)
HYDRAULIC OPEN CYLINDER**

ITEM	PART NO.	DESCRIPTION
1.	23N142A	Clevis Cap
2.	23N143A	Rod Cap
3.	23N144	Piston
4.	BFR322A	Rod
5.	BFR323	Cylinder Tube
6.	BFR324	Tie Rod
7.	23N148	Piston Nut
8.	23N149	Plug
9.	23N150A	Rod Clevis
10.	23N151	Seal Kit
11.	BFR288A	Complete Cylinder

H&S DELUXE BI-FOLD RAKE

Your new H&S Deluxe 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 Bi-Fold Rake before reading this manual carefully. Keep this manual available for ready reference.

DELUXE BI-FOLD SPECIFICATIONS

	12 WHEEL	16 WHEEL
Overall Width - Transport	.116"	.118"
Overall Length - Transport	.22'	.26'7"
Width Outside Tires	.75"	.77"
Height to Bottom of Frame	.26"	.26"
Weight	.2100 lbs	.3430 lbs.
Adjustable Hitch	.10 Positions	.10 Positions
Number of Rake Wheels	.12	.16
Number of Teeth per Rake Wheel	.40	.40
Overall Diameter of Rake Wheel	.55"	.55"
Raking Widths	.18' - 24"	.24'6" - 31'6"
Windrow Widths	.33" - 60"	.33" - 60"
Swing Away Jack w/Storage Position	.Standard	.Standard
Gauge Wheels (2)	.Standard	.Standard
Center Kicker Wheel	.Option	.Option
Tire Size	.15"	.15"

NOTE

Determine right or left side of Deluxe Rake by viewing it from the rear. If instructions or parts lists call for hardened bolts, they are identified as Grade 5 by 3 lines on the head.

H&S MANUFACTURING CO. INC.

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MARSHFIELD, WI 54449



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P.O. Box 1260 - Telephone (716) 736-7595
FAX (716) 736-7596
RIPLEY, NY 14775

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