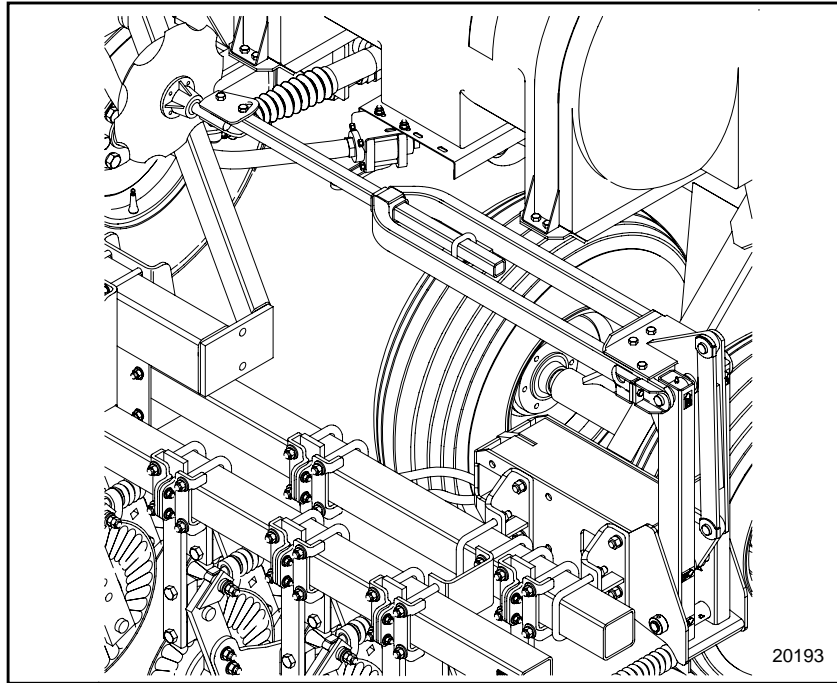


Operator's/Parts Manual

Precision Fertilizer Hitch
Flat Fold Marker



Read the operator's manual entirely. When you see this symbol, the subsequent instructions and warnings are serious - follow without exception. Your life and the lives of others depend on it!



Cover illustration may show optional equipment not supplied with standard unit.



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General Information

Important Notice

Great Plains Manufacturing, Inc. provides this publication “as is” without warranty of any kind, either expressed or implied, while every precaution has been taken in the preparation of this manual, Great Plains Manufacturing, Inc. assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein. Great Plains Manufacturing, Inc. reserves the right to revise and improve its products as it sees fit. This publication describes the state of this product at the time of its publication, and may not reflect the product at all times in the future.

Printed in the United States of America.

For your convenience, record your Model and the Date Purchased on page 4. Have this information before you when calling a Great Plains Authorized Dealer.

This Operator’s Manual applies to the Product Name listed below:

113-469A PFH Dual Marker 15 ft.

113-470A PFH Dual Marker 20 ft.



Introduction

Great Plains welcomes you to its growing family of new product owners. This PFH Flat Fold Marker has been designed with care and built by skilled workers using quality materials. Proper setup, maintenance and safe operating practices will help you get years of satisfactory use from the marker.

Description of Unit

The parts on your PFH Flat Fold Marker have been specially designed and should only be replaced with genuine Great Plains parts. Therefore, should your PFH Flat Fold Marker require replacement parts go to your Great Plains Dealer.

Using This Manual

This manual will familiarize you with safety, assembly, operation, adjustments and maintenance. Read this manual and follow the recommendations to help ensure safe and efficient operation.

The information in this manual is current at printing. Some parts may change to assure top performance.

Definitions

The following terms are used throughout this manual.

Right-hand and left-hand as used in this manual are determined by facing the direction the machine will travel while in use unless otherwise stated.

IMPORTANT: A crucial point of information related to the preceding topic. For safe and correct operation, read and follow the directions provided before continuing.

NOTE: Useful information related to the preceding topic.



Important Safety Information

Look for Safety Symbol

The SAFETY ALERT SYMBOL indicates there is a potential hazard to personal safety involved and extra safety precaution must be taken. When you see this symbol, be alert and carefully read the message that follows it. In addition to design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.



Be Aware of Signal Words

Signal words designate a degree or level of hazard seriousness.

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.



WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.



CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.





Owner Assistance

If you need customer service or repair parts, contact a Great Plains dealer. They have trained personnel, repair parts and equipment specially designed for Great Plains products.

Your machine's parts were specially designed and should only be replaced with Great Plains parts. Always use the model number when ordering parts from your Great Plains dealer.

Record your Model and Date Purchased here for quick reference:

Model: _____

Date Purchased: _____

Your Great Plains dealer wants you to be satisfied with your new machine. If you do not understand any part of this manual or are not satisfied with the service received, please take the following actions.

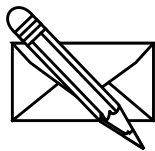
1. Discuss the matter with your dealership service manager. Make sure they are aware of any problems so they can assist you.
2. If you are still unsatisfied, seek out the owner or general manager of the dealership.
3. For further assistance write to:

Product Support

Great Plains Mfg. Inc., Service Department

PO Box 5060

Salina, KS 67402-5060





Operating and Repair

Most accidents are the result of negligence and carelessness, usually caused by failure of the operator to follow simple but necessary safety precautions. The following safety precautions are suggested to help prevent such accidents. The safe operation of any machinery is a big concern to consumers and manufactures. Your PFH Flat Fold Maker has been designed with many built-in safety features. However, no one should operate this product before carefully reading this Operators Manual.

General Operation & Repair

Never allow the PFH Flat Fold Marker to be operated by anyone who is unfamiliar with the operation of all functions of the unit. All operators should read and thoroughly understand the instructions given in this manual prior to moving the unit.

1. Make sure safety rules are understood before operating machinery or tractor.
2. Never permit any persons other than the operator to ride on the tractor.
3. Never permit any persons to ride on or stand near the drill while it is in operation.
4. Regulate your speed to the field conditions, maintaining complete control at all times.
5. After repairing or adjusting, make sure all tools and parts are removed from the implement before attempting to operate it.
6. Do not grease or oil machine while it is in operation.
7. Loose fitting clothing should not be worn as it may catch in moving parts.
8. Never dismount from a moving tractor.
9. Do not leave the tractor or the implement unattended with the engine running.
10. Do not stand between the tractor and the implement during hitching.
11. Detach and store implements in an area where children normally do not play. Stabilize implements by using suitable supports and block wheels.

12. If a hydraulic leak develops, correct it immediately. Escaping hydraulic oil can have extremely high pressure. A stream of high pressure oil may easily penetrate the skin as with modern needle-less vaccination equipment - but with the exception that hydraulic fluid may cause blood poisoning. It is imperative that the connections are tight and that all lines and pipes are in good condition. If an injury is caused by the escaping hydraulic fluid, see a doctor at once!
13. Use a piece of cardboard or wood to detect leaks of hydraulic oil under pressure.
14. Be sure to relieve all hydraulic pressure before disconnecting any lines or pipes between the implement and the tractor hydraulic system. Keep all guards and shields in place.

Transporting

1. Use good judgement when transporting tractor and implements on the highway. Always maintain complete control of the machine.
2. Limit transport speed to 20 mph. Transport only with a farm tractor of sufficient size and horse power.
3. Always make sure flashing safety lights, "Slow Moving Vehicle" emblem and reflectors are in place and visible prior to transporting the machine on public roads.
4. Know your state and local laws concerning highway safety and regulations. Comply with these laws when transporting machinery.
5. Use warning flags or approved warning lights at night and during other periods of poor visibility. Do your best to prevent highway accidents.



Assembly

NOTE: While using the following text to install your flat fold marker, you may need to refer to the parts section of this manual for more details and for positive identification of related items not mentioned in these instructions.

Refer to Figure 1

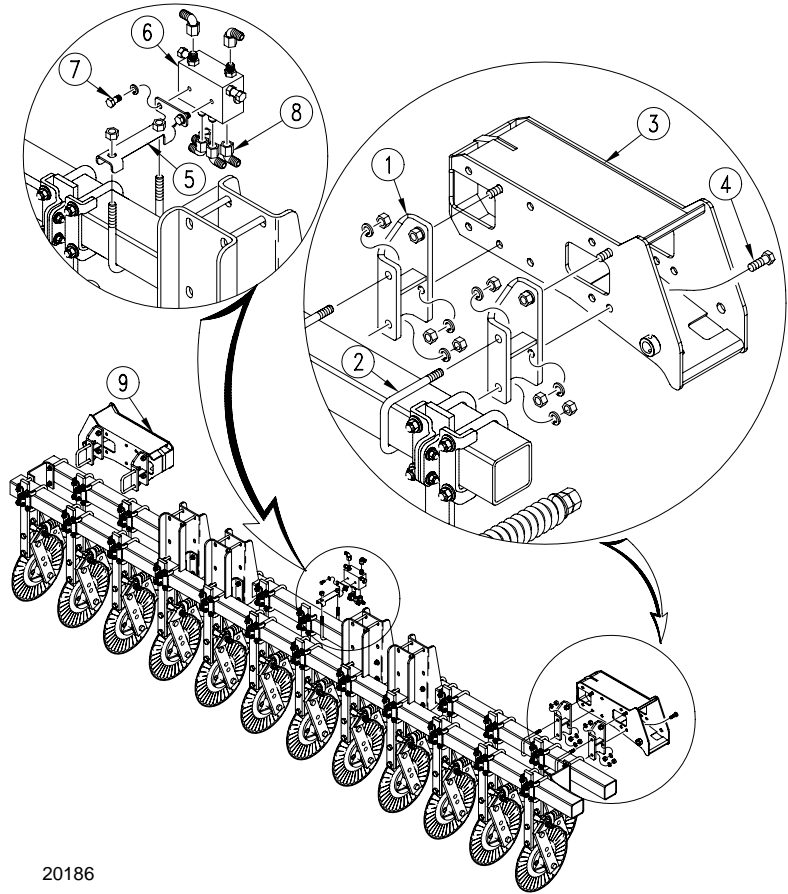
Note: Refer to charts on pages 7, 8, 9 or 10 for measurements appropriate to your drill width and row spacing.

1. Lower the hitch to field position. Allow clearance of 9' on a 15' drill and 11' on a 20' drill from each end of the coulter tool bar for marker assembly.
2. On the left-hand side of the drill position the two marker mount adapters (1) on the 4" square tube and hold in place with 5/8" x 4" x 6" U-bolts (2), 5/8" lock washers and 5/8" nuts, leaving nuts loose.

Note: On the 20' marker with 6" and 7 1/2" spacings (left side only) two 5/8" x 6 1/2" hex bolts are used in place of the U-bolt. Remove the bolts used to mount the tool bar and insert the 6 1/2" bolts.

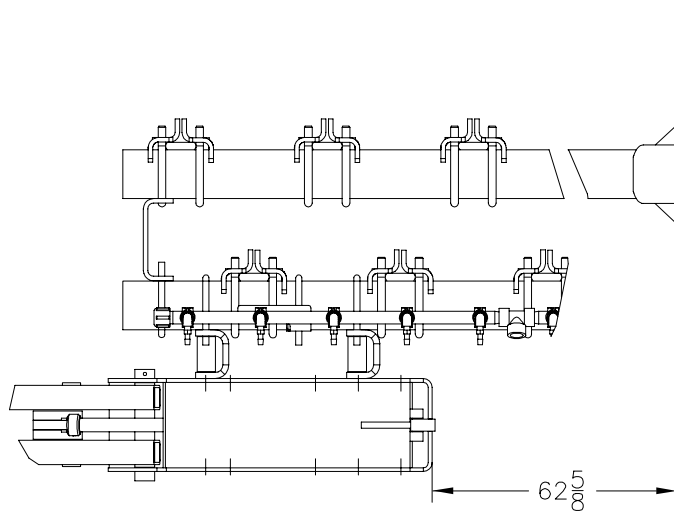
3. Using the appropriate chart for hole location attach the marker mount (3) to the marker mount adapters (1) using 5/8" x 1 3/4" bolts 5/8" lock washers and 5/8" nuts. Tighten bolts.
4. Measure from the inside end of the marker mount (3) to the outside surface of the drill center frame as shown in the charts. Set the marker mount (3) to the correct distance and tighten U-bolts (2).
5. Install the right-hand marker mount (9) to the right-hand side using steps 2 through 4.
6. Install the marker valve mount (5) just to the right of center on the coulter frame tube. Clamp the marker valve mount (5) in place with a 1/2" x 4" x 5 1/4" U-bolt. Assemble the valve (6) to the mount with the 4-port side downward using two 3/8" x 3/4" long bolts (7) and 3/8" lock washers.
7. Install the six JCI fittings in the ports with the elbows facing out.

NOTE: JIC fittings do not require high torque. JIC and O-Ring fittings do not require sealant. Always use liquid pipe sealant when adding or replacing pipe thread fittings. To avoid possible danger of cracking hydraulic fittings from over tightening, DO NOT use plastic sealant tape.

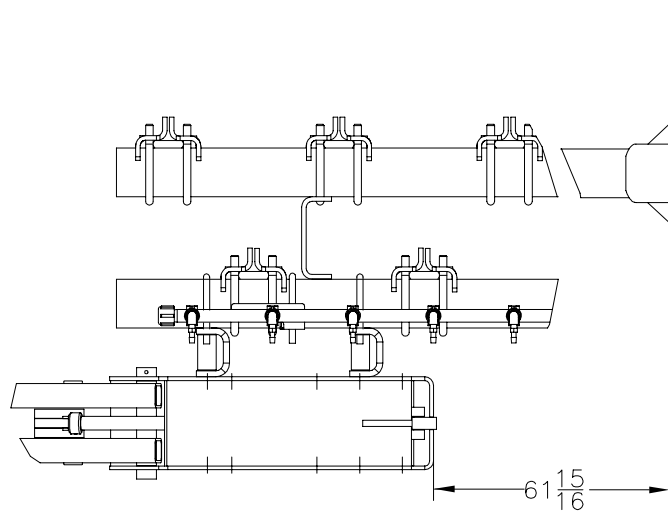
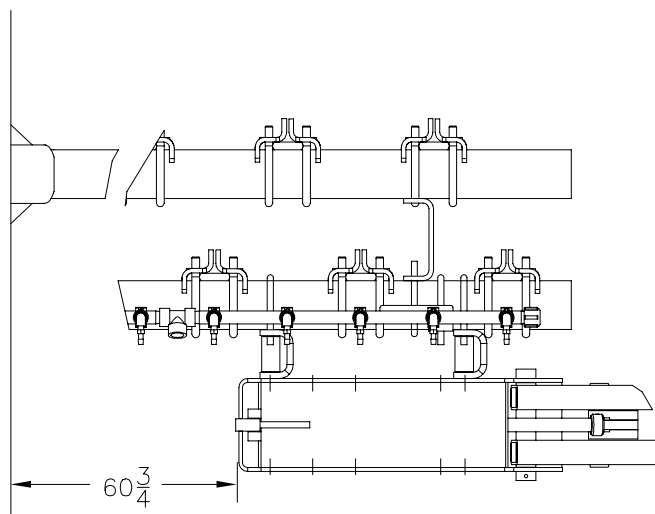


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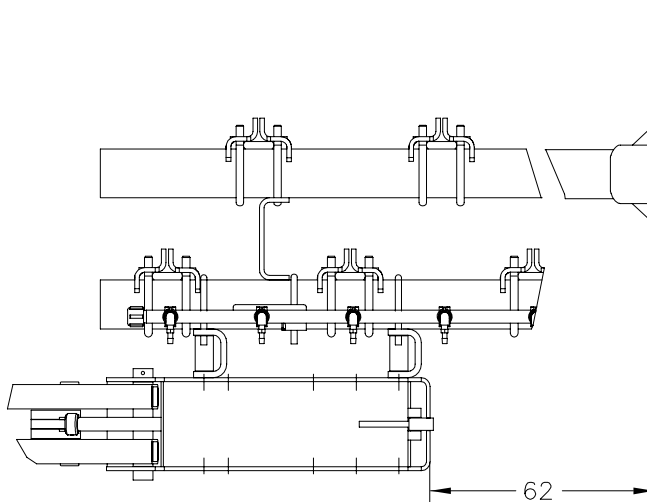
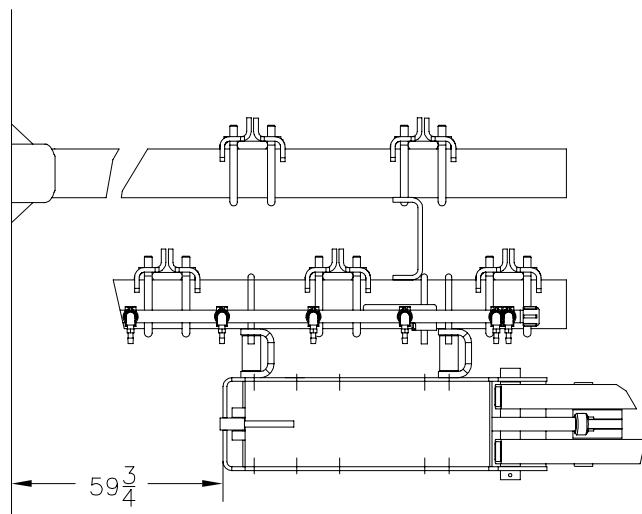
Figure 1
Assembly



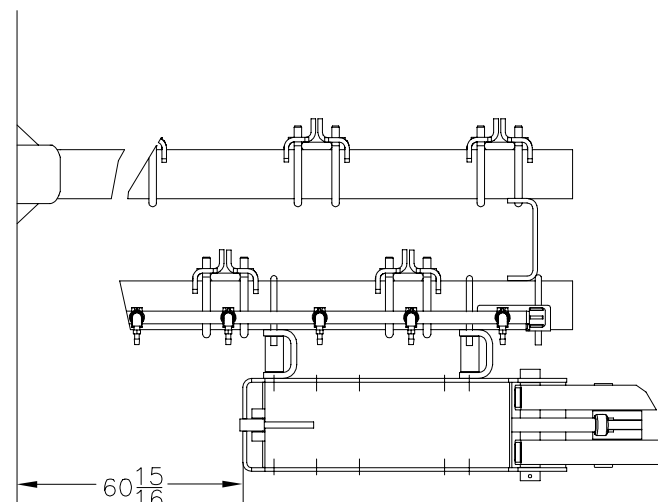
PFH 15FT 6 IN SPACING



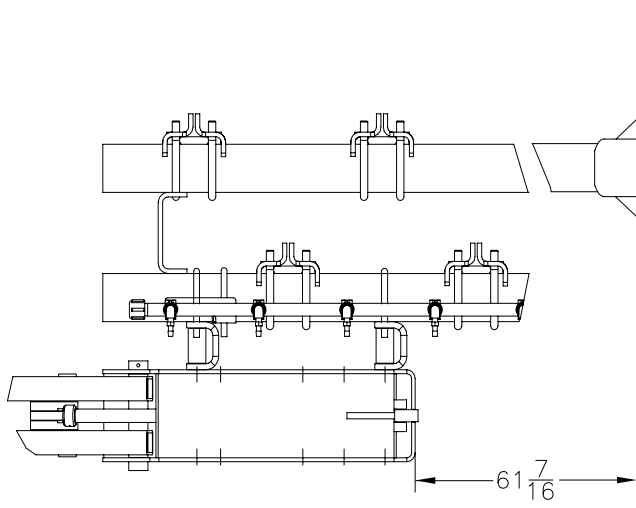
PFH 15FT 7 IN SPACING



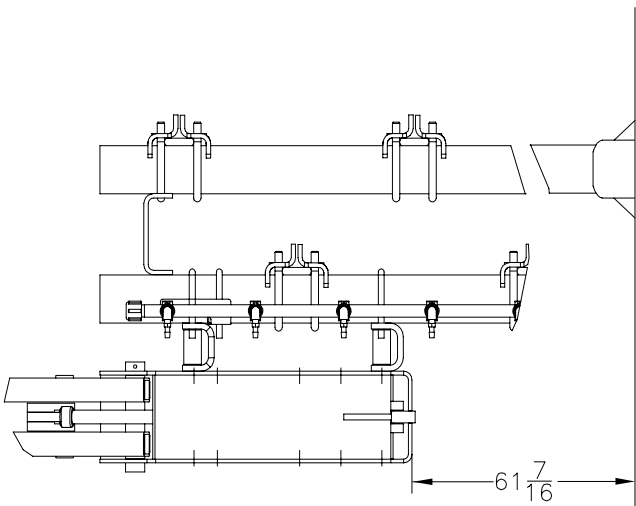
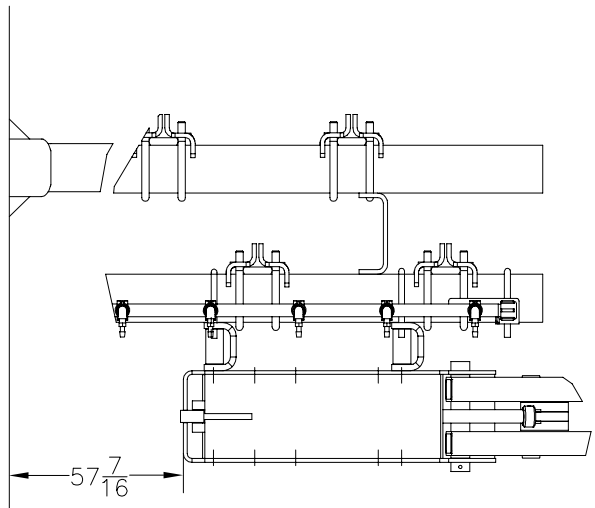
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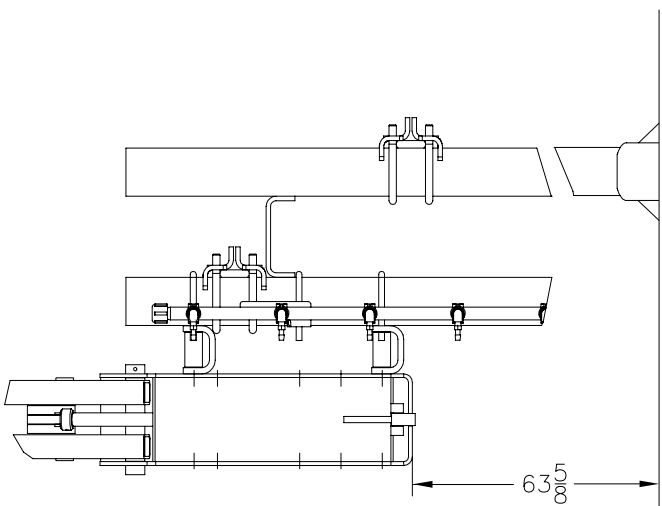
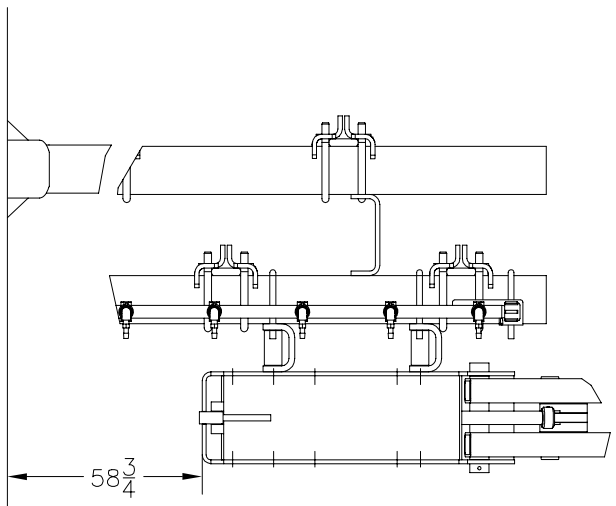
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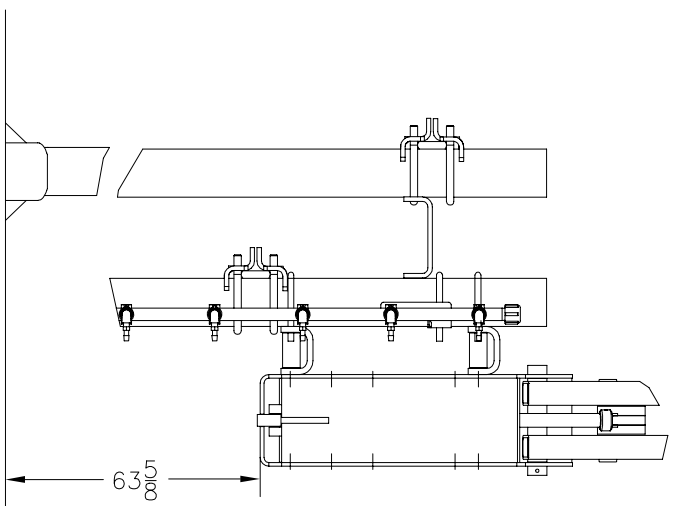
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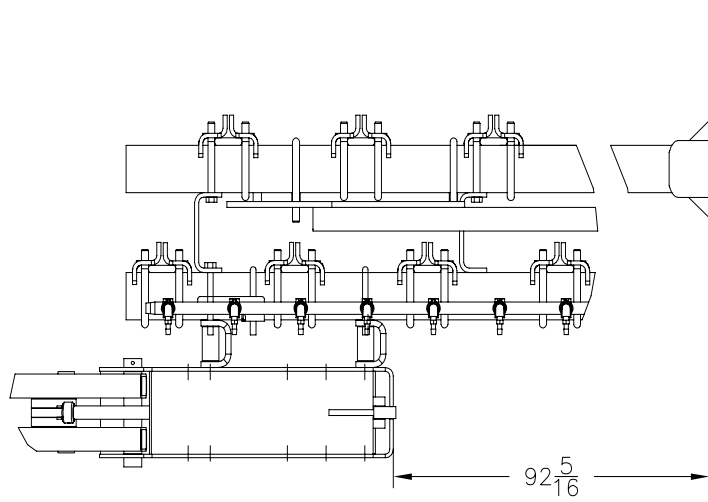
PFH 15FT 10 IN SPACING



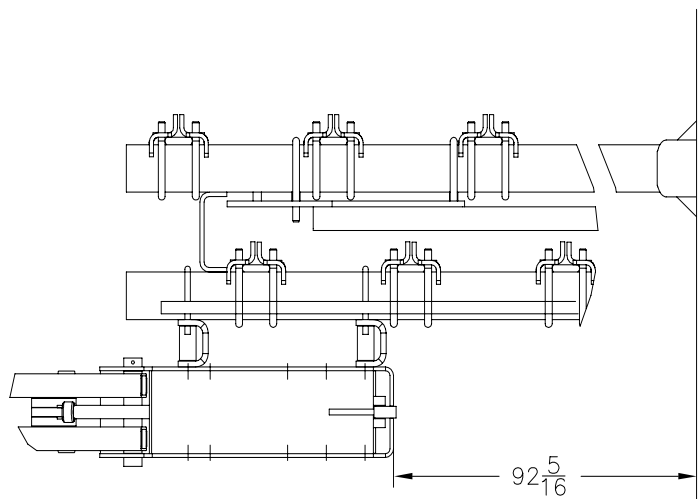
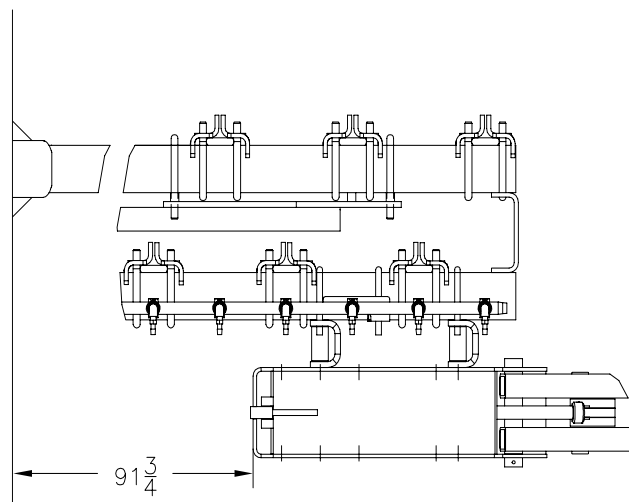
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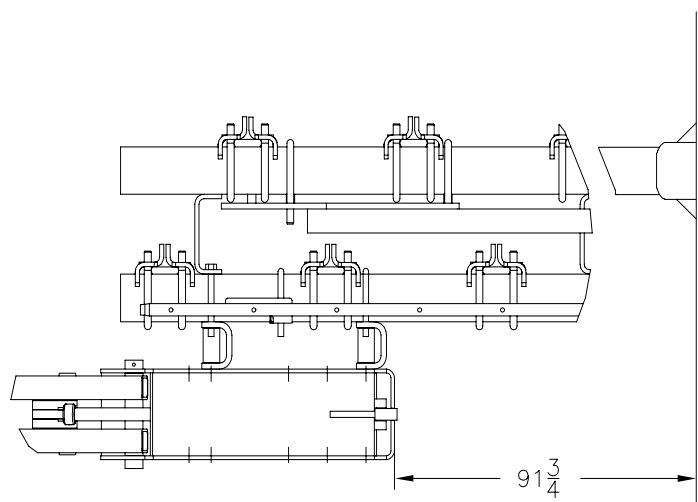
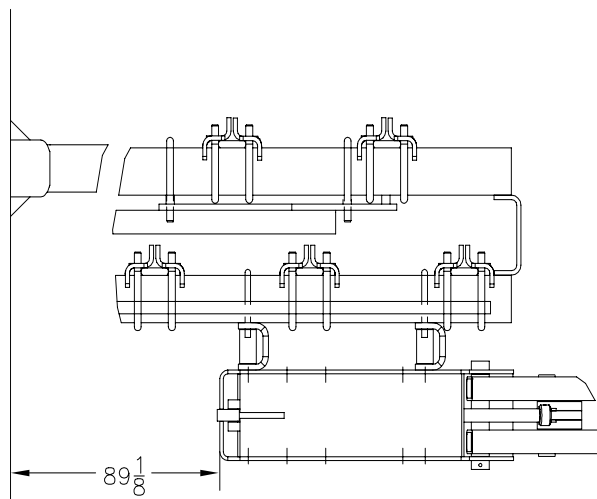
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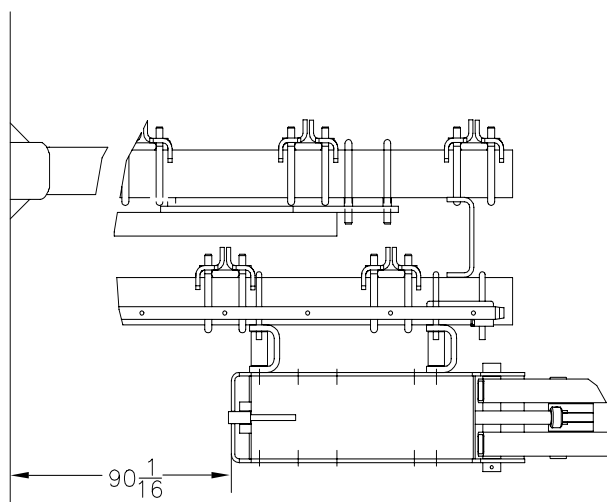
PFH 20FT 6IN SPACING



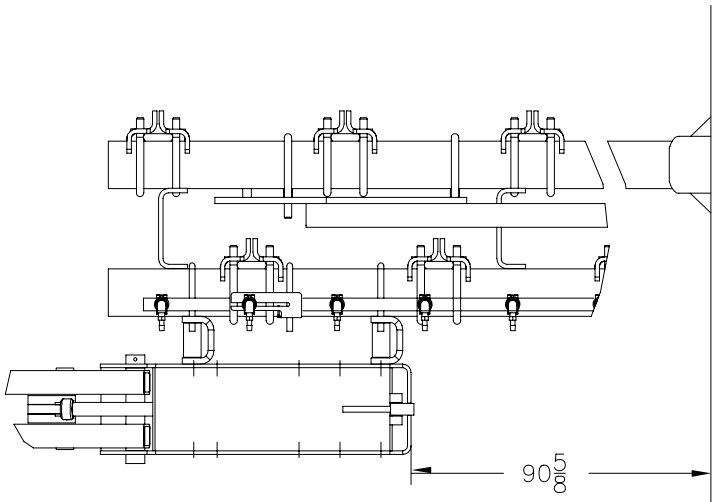
PFH 20FT 7IN SPACING



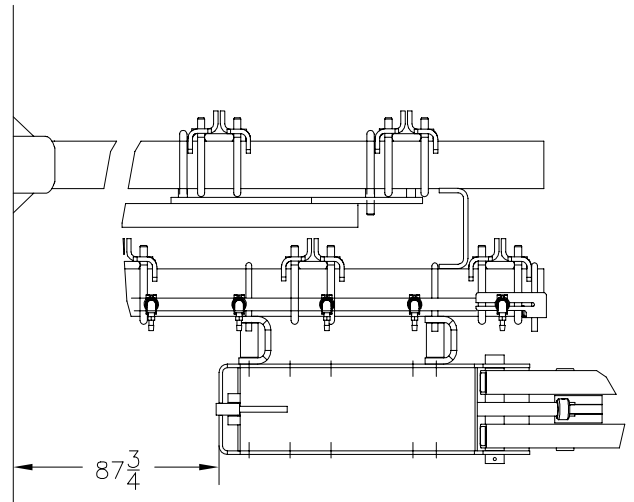
PFH 20FT 7 1/2 IN SPACING



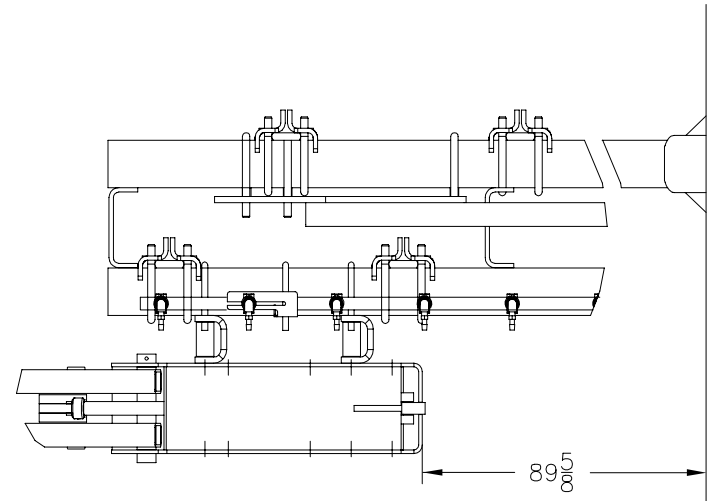
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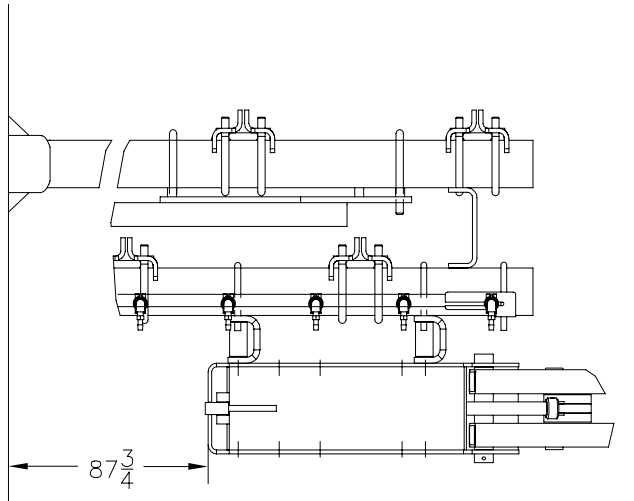
PFH 20FT



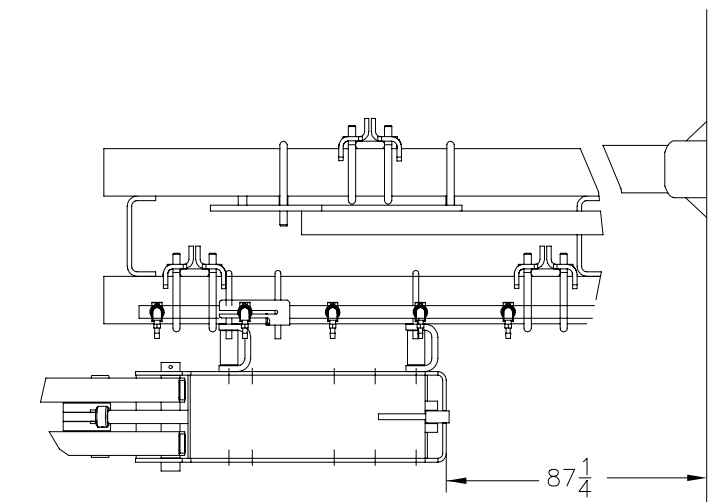
8 IN SPACING



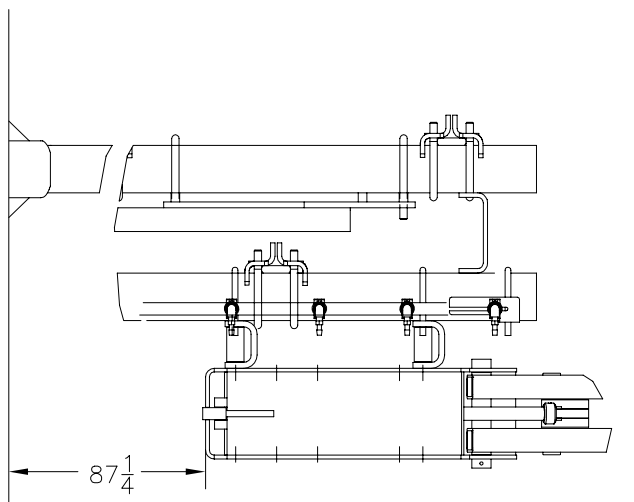
PFH 20FT



10 IN SPACING



PFH 20FT



15 IN SPACING

20253

Refer to Figure 2

8. Route the hoses from each marker through the mount and out the opening in the inside end of the mount.
9. Route the hoses along the coulter frame tube and tie them to the tube with the releasable cable ties (6).
10. Connect the hoses to the sequence valve (7) with four JIC elbows (5). Note the port markings and refer to the drawing for proper connections.
11. Connect the two 156" long hoses (8) to the two top ports of the sequence valve with two elbows (5) and route them to the tongue and through the hose loop. Use releasable cable ties to secure hose to frame.

NOTE: Check the hydraulic fluid in the tractor reservoir and fill it to the proper level. Add fluid to the system as needed. A low reservoir may draw air back into the system causing jerky or uneven movement. The fluid capacity of the markers is .75 gallons.

12. With the first section in the lowered position, connect the hoses to the tractor and cycle each cylinder 3 or 4 times. Both arms should move to the vertical position on the first move and then they should lower and raise alternately as the hydraulic lever is operated.

! DANGER

Keep all persons clear of the marker when operating. Air in the hydraulic system can cause the marker arm to drop quickly. Make sure the system is properly charged.

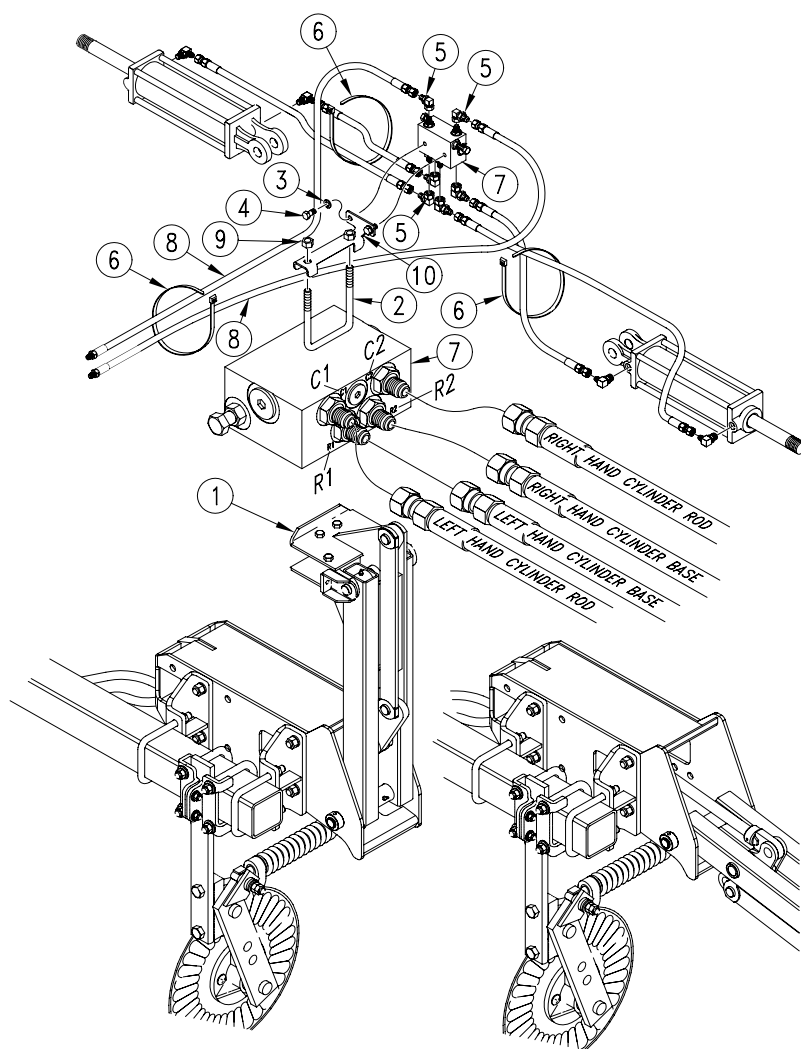
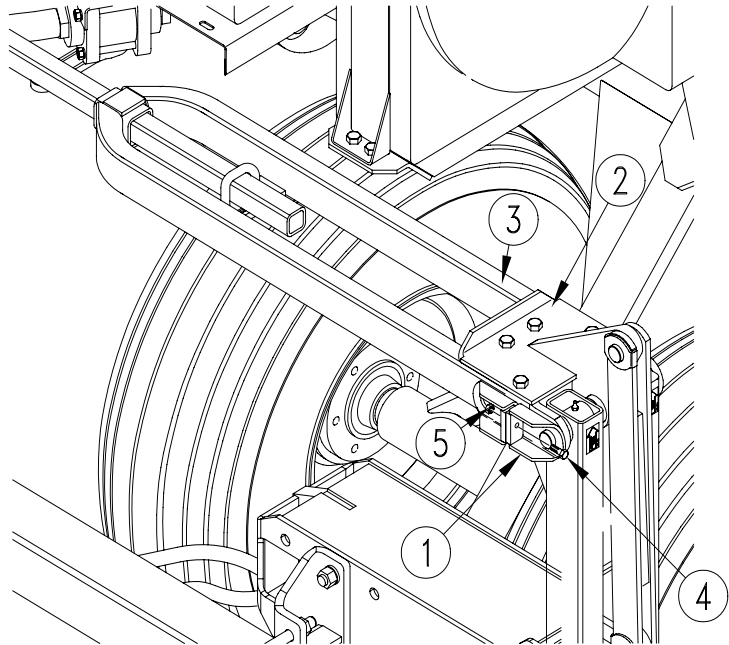


Figure 2
Hydraulic Assembly

20187

Refer to Figure 3

13. Check the orientation of the second section mounting pin (1). The second stage mounting pin (1) must be assembled into the hinge with the flanged head toward the tongue end of the hitch for the breakaway to work properly. If not, pull it out and insert it from the other direction.
14. Remove the rear $1/2 \times 3 \frac{1}{2}$ long bolt (2) from the second section mount and install the second marker section (3) between the plates. Align the holes and replace the bolt and lock nut. Bolt the front flange on the second section to the flange on the second section mounting pin with a $5/16 \times 1 \frac{1}{2}$ long grade 5 bolt (4) and locknut (5).



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Figure 3
Second Section

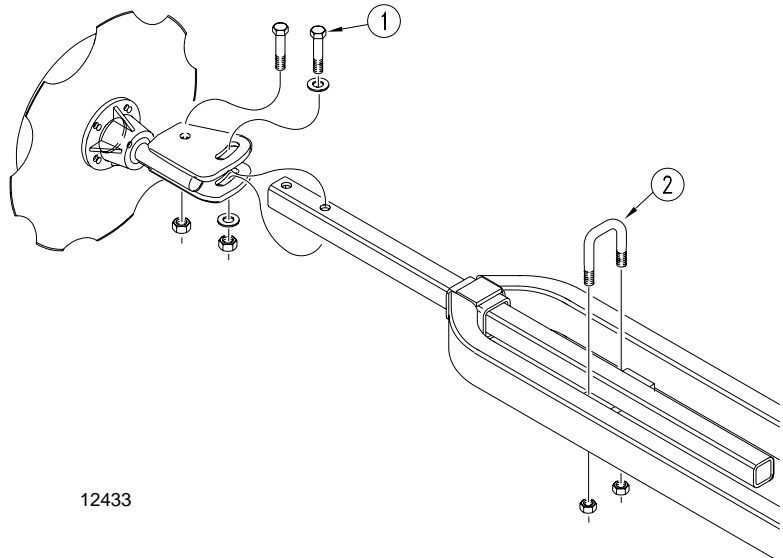
Disk Adjustments

*Refer to Figure 4***Disk Angle**

1. To change the angle of cut, loosen the two bolts (1), rotate the disk assembly and retighten.

Marker Width

2. Marker width adjustments are made by loosening the marker tube U-bolt (2) and sliding it in or out to the desired width and retightening the U-bolt.



12433

Figure 4
Disk Adjustments



Hydraulic System

Adjusting The Hydraulics

1. Be sure tractor hydraulic reservoir is full.
2. Fold and unfold the marker(s) slowly in order to work all the air out of your marker hydraulics. Use caution when folding and unfolding the marker for the first time, and check for pinching and kinking of hoses.



CAUTION

Never allow anyone near the drill when cycling the markers.

3. The marker hydraulic system is equipped with needle valves to control how fast each marker operates. The needle valves are built into the sequence valve body. There are two hex adjustment heads, one for raising the markers, and one for lowering the markers. These are stamped in the valve body. To adjust the speed of each marker, screw the needle valve clockwise to adjust the raise or lower marker speed to a low setting. Fold the marker up and down a few times and recheck for pinching and kinking of hoses. With the tractor engine at an operating rpm, adjust the needle valve to limit the marker to a safe operating speed. Excessive folding speeds can cause marker damage.



CAUTION

Escaping Fluid under pressure can have sufficient force to penetrate the skin. Check all hydraulic lines and hoses before applying pressure. Fluid escaping from a very small hole can be almost invisible. Use paper or cardboard, not body parts, to check for suspected leaks. If injured, seek medical assistance from a doctor who is familiar with this type of injury. Foreign fluids in the tissue must be surgically removed within a few hours or gangrene will result.

NOTE: JIC fittings do not require high torque. JIC and O-Ring fittings do not require sealant. Always use liquid pipe sealant when adding or replacing pipe thread fittings. To avoid possible danger of cracking hydraulic fittings from over tightening, DO NOT use plastic sealant tape.

General Notes

The markers cycle in the following sequence:

- | | |
|-----|---------------------|
| (1) | Right Up, Left Up |
| (2) | Right Down, Left Up |
| (3) | Right Up, Left Up |
| (4) | Right Up, Left Down |
| (5) | Sequence Repeats |



Maintenance and Lubrication

Maintenance

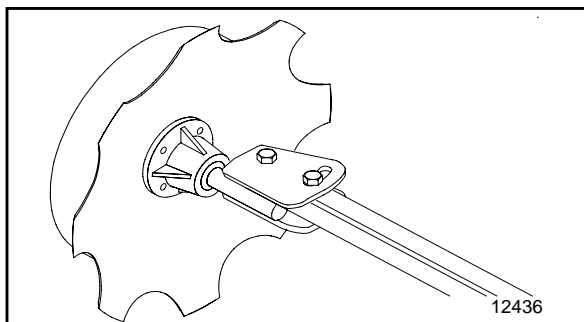
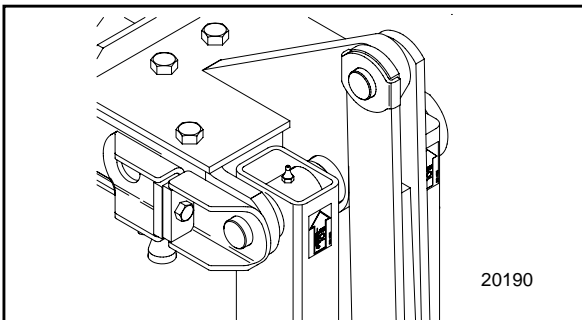
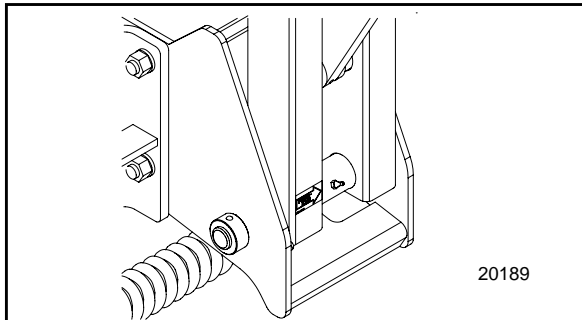
Proper servicing and adjustment is the key to the long life of any farm implement. With careful and systematic inspection, you can avoid costly maintenance, downtime and repair.

Breakaway Protection

The marker arm is attached to the marker body with a 5/16" breakaway bolt. If excessive force is put on the marker during operation, the bolt will break, allowing the marker arm to swing away rather than cause damage to the marker.

NOTE: The breakaway bolt is a 5/16"-18 x 1 1/2" long grade 5 (G.P. # 802-012C). It is identified as a grade 5 by having three marks on the head. If it breaks, it must be replaced by an equivalent grade 5 bolt to prevent marker damage.

Lubrication



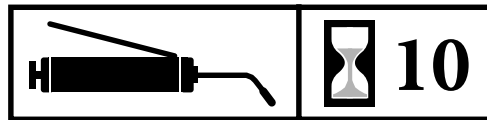
Marker Transporting

Always transport the marker with it folded in the flat fold position.

Storage

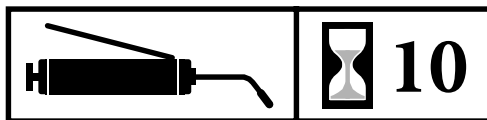
Clean the PFH Flat Fold Marker as necessary.

1. Lubricate zerks as indicated in the lubrication section.
2. Store the PFH Flat Fold Marker inside, if possible, for longer PFH Flat Fold Marker life.



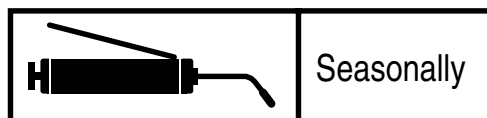
Zerks

Type of Lubrication: Grease after 10 hours of use.



Zerks

Type of Lubrication: Grease after 10 hours of use.



Disk Bearings

Type of Lubrication: Grease at the beginning of each season.



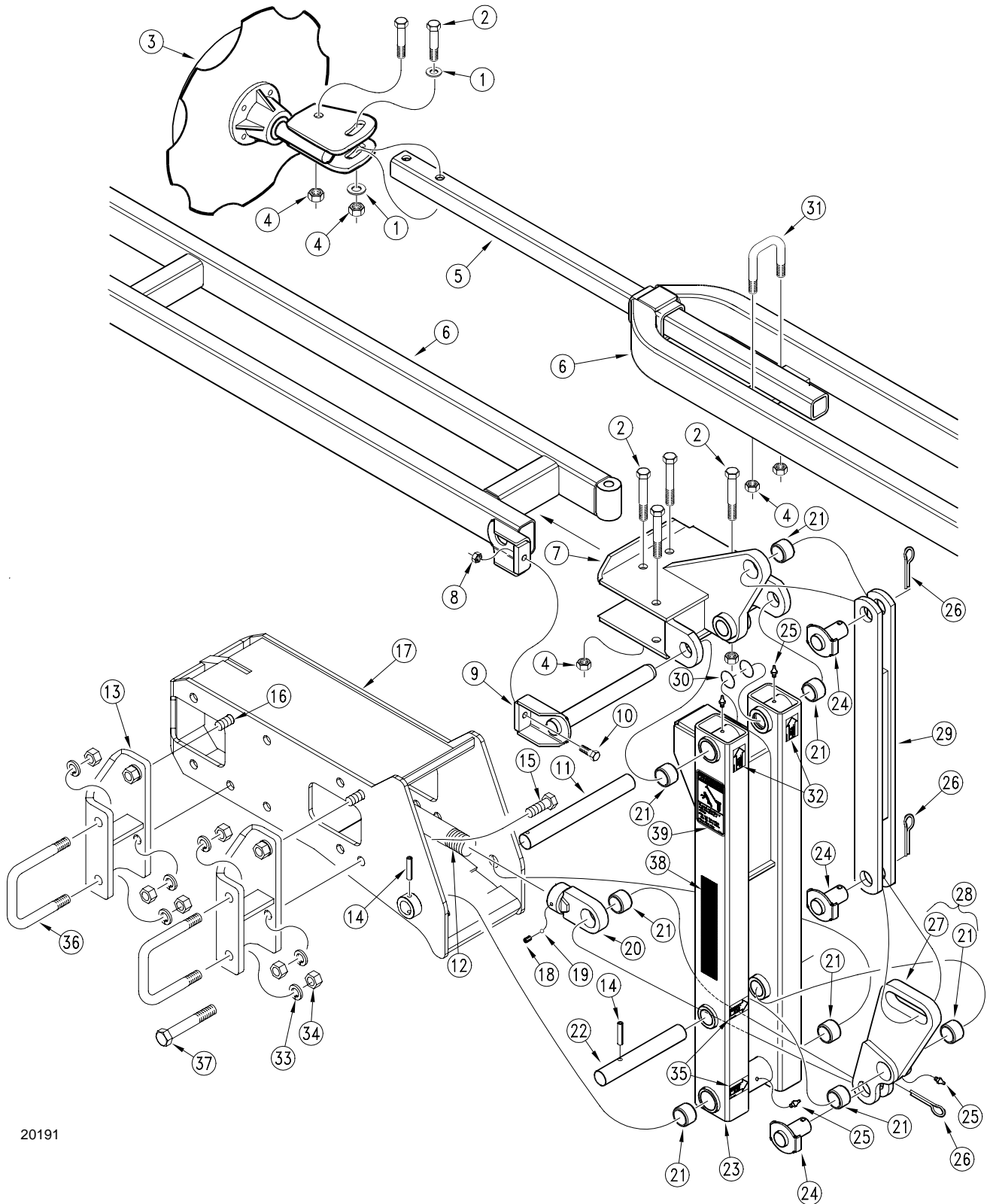
Troubleshooting

Problem	Solution
Hydraulic marker functioning improperly	Check all hose fittings and connections for air and oil leaks.
	Check tractor hydraulic oil level.
	Check all bolts and fasteners.
	If needle valve is plugged; open valve, cycle markers and reset the needle valve.
Blade does not mark	The maximum marker down float is limited by the slot in the pivot link. If the blade does not drop down to follow depressions in the field, make sure the marker cylinder is fully extended.



Parts

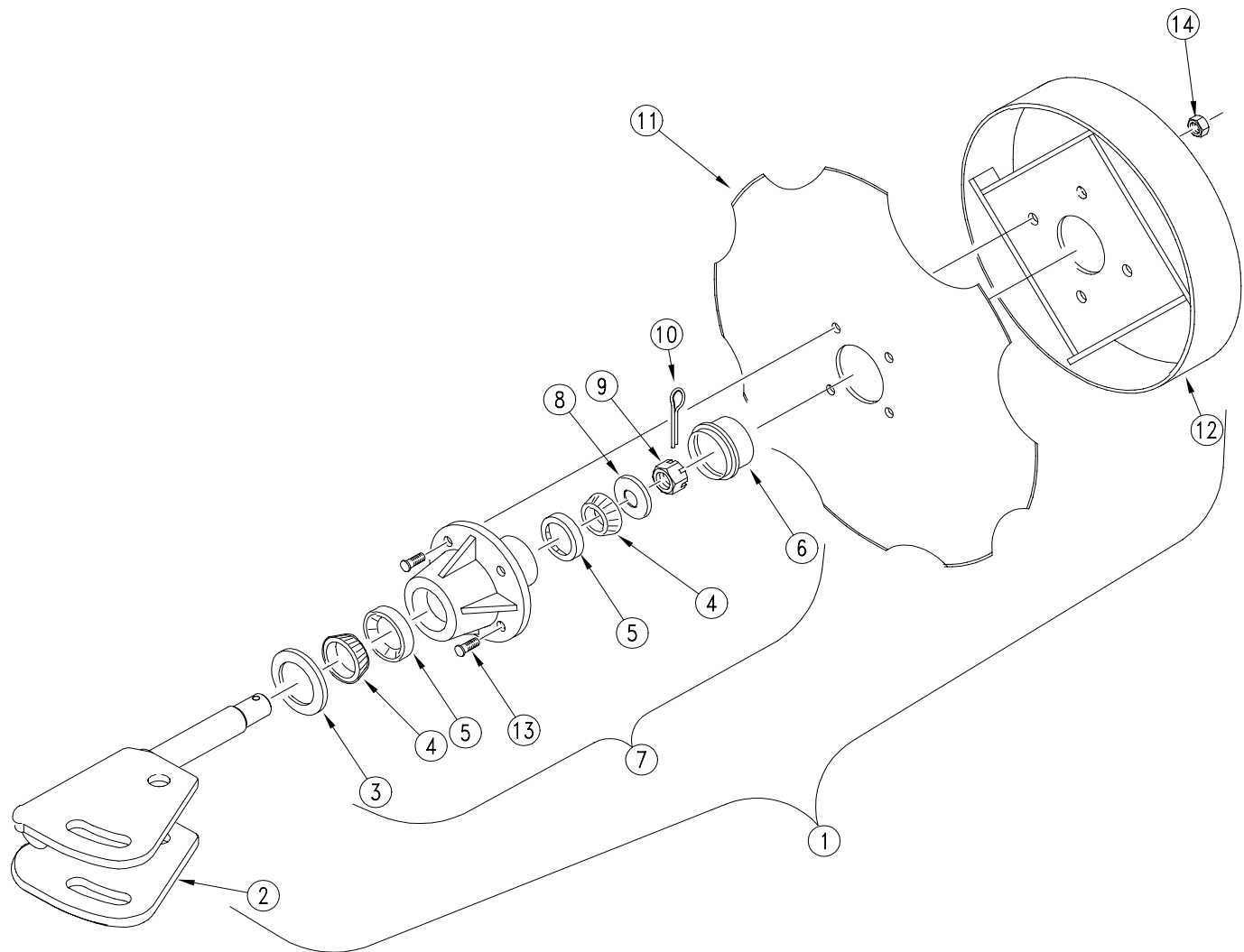
Flat Fold Marker Assembly



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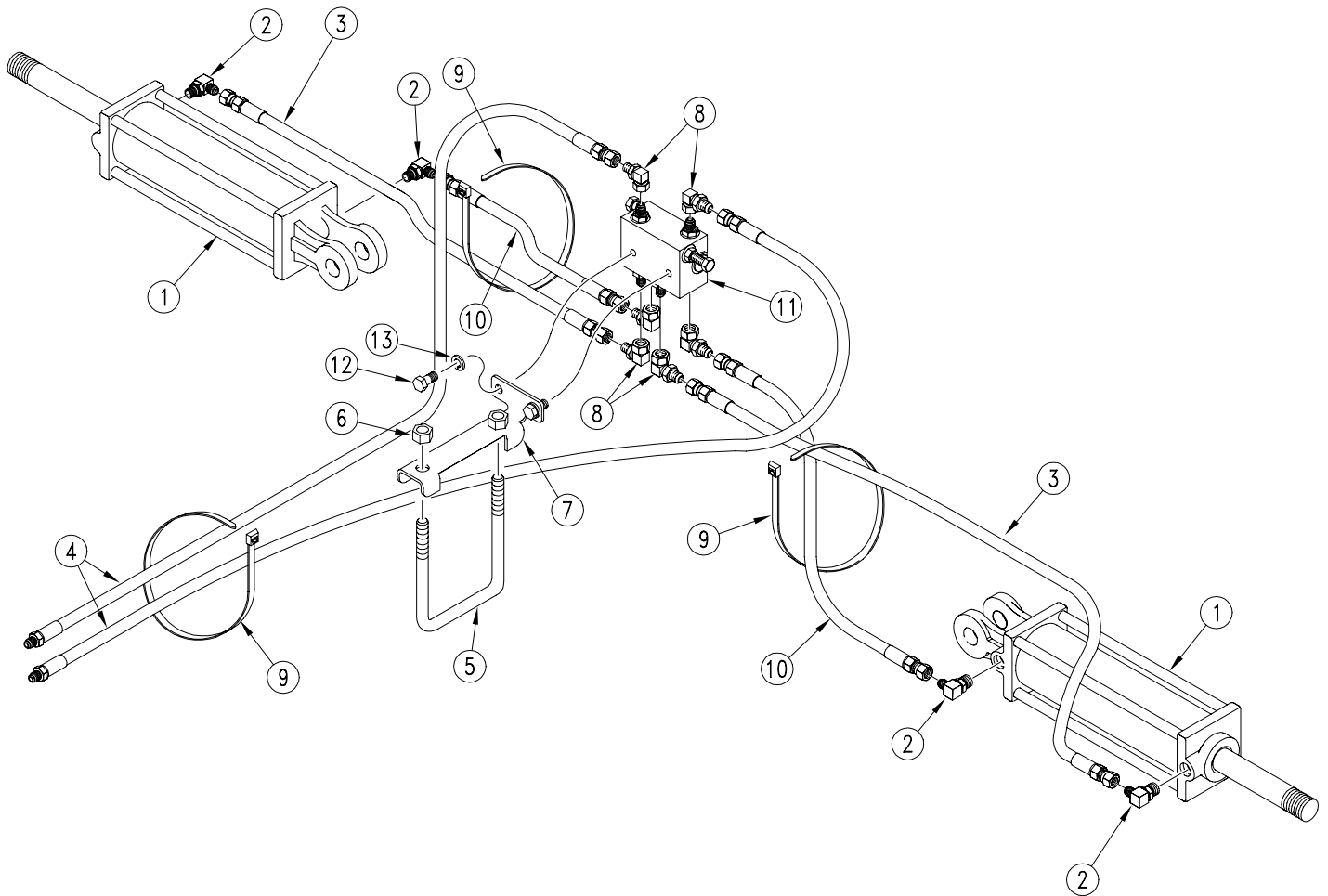
Ref.	Part No.	Description
1.	804-017C	WASHER FLAT 1/2 USS PLT
2.	802-041C	HHCS 1/2-13X3 1/2 GR5
3.	113-563S	MARKER DISC & HUB ASSEMBLY
4.	803-019C	NUT LOCK 1/2-13 PLT
5.	113-353D	MARKER TUBE 51 LG
6.	113-449H	6 ROW 2ND STAGE ARM WMNT
	113-450H	8 ROW 2ND STAGE ARM WMNT
7.	113-440H	2ND STAGE MOUNT WMNT
8.	803-011C	NUT LOCK 5/16-18 PLT
9.	113-442H	2ND STAGE MOUNT PIN
10.	802-012C	HHCS 5/16-18X1 1/2 GR5
11.	113-439D	1ST STAGE MOUNTING PIN
12.	810-196C	CYL 2.5X10X1.12 ROD (TIE)
13.	113-766H	MARKER MOUNT ADAPTOR
14.	805-180C	PIN ROLL 1/4 X 1 1/2 LG PLT
15.	802-053C	HHCS 5/8-11X1 3/4 GR5
16.	802-335C	HHCS 5/8-11X6 1/2 GR5
17.	113-765H	MARKER MOUNT PFH
18.	801-045C	SCREW SET 1/4-28X1/4 KNL CUP
19.	817-145C	THREAD PROTECTOR-DELRIN
20.	113-444H	CYLINDER TANG WMNT
21.	890-143C	BUSHING HARDENED 1 1/4-1-3/4 L
22.	113-438D	CYLINDER LINK PIN
23.	113-437H	1ST STAGE ARM WELDMENT
24.	113-448H	CYL. PIVOT PIN WMNT
25.	800-001C	GREASE ZERK STRAIGHT 1/4-28
26.	805-060C	PIN COTTER 7/32 X 2
27.	113-447E	PIVOT LINK WELDMENT
28.	113-453S	PIVOT LINK BUSHING ASSY
29.	113-446H	TRANSFER LINK WMNT
30.	816-166C	O-RING 1 ID X 1 1/4 OD X 1/8
31.	806-103C	U-BOLT 1/2-13 1 17/32 X 2 3/4
32.	818-349C	DECAL GREASE 10 HRS LH
33.	804-022C	WASHER LOCK SPRING 5/8 PLT
34.	803-021C	NUT HEX 5/8-11 PLT
35.	818-402C	DECAL GREASE 10 HRS RH
36.	806-105C	U-BOLT 5/8-11 X 4 1/32 X 6
37.	802-262C	HHCS 5/8-11X7 GR5
38.	838-265C	DECAL REFLECTOR AMBER 1 1/2X9
39.	818-682C	DECAL WARNING PINCH/CRUSH MRKR

Disk Assembly



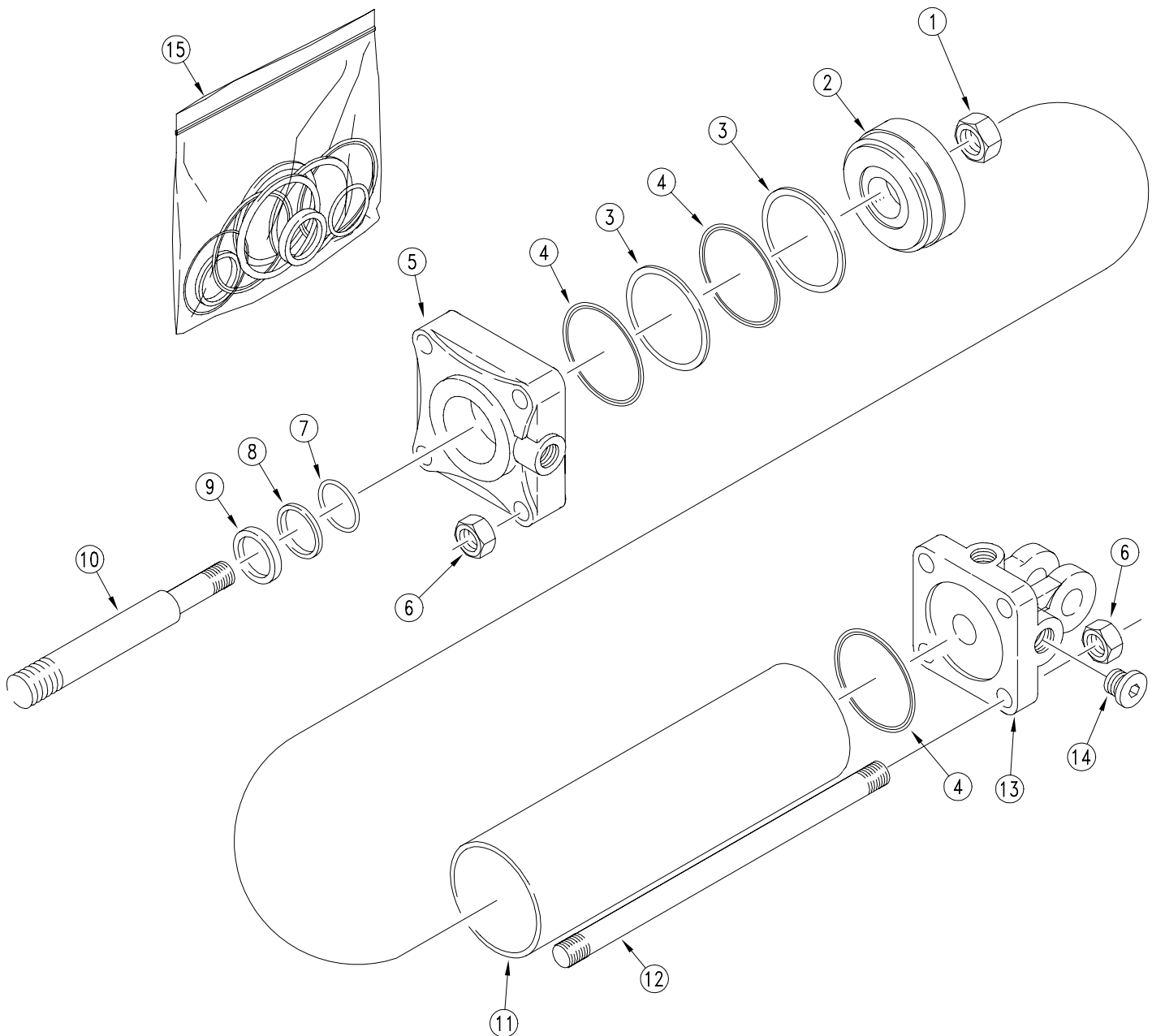
Ref.	Part No.	Description
<hr/>		
1.	113-563S	MARKER DISC & HUB ASSEMBLY
	113-564S	REP BY 113-563S
	113-372S	REP BY 113-564S
2.	113-562H	1 SPINDLE MARKER WELDMENT
3.	816-014C	TINE GAUGE MARKER HUB SEAL
4.	822-030C	BEARING CONE L44643
5.	822-080C	BEARING CUP L44610
6.	890-614C	GREASE CAP #1505
7.	815-001C	TINE GW HUB
8.	804-025C	WASHER FLAT 3/4 SAE PLT
9.	803-053C	NUT HEX SLOTTED 3/4-16
10.	805-019C	PIN COTTER 5/32 X 1 PLT
11.	820-094C	16 4-BOLT NOTCHED MARKER DISK
12.	133-369H	DEPTH BAND 10 4-BOLT 4B.C.
13.	BO-47	NEILSON STUD 1/2-20UNF X 1 13/16
14.	803-159C	NUT LUG 1/2-20 X 60 DEG PLT

Hydraulic Assembly



Ref.	Part No.	Description	
1.	810-196C	CYL 2.5X10X1.12 ROD (TIE)	
2.	811-065C	EL 9/16MJIC 9/16MORB	
3.	811-226C	HH1/4R1 127 9/16FJIC	Used on 20'
	811-230C	HH1/4R1 095 9/16FJIC	Used on 15'
4.	811-436C	HH1/4R1 156 9/16FJIC 1/2MNPT	
5.	806-056C	U-BOLT 1/2-13 X 4 1/32 X 5 1/4	
6.	803-019C	NUT LOCK 1/2-13 PLT	
7.	149-562D	SEQ VALVE MOUNT 4IN TUBE	
8.	811-169C	EL 9/16MJIC 9/16FJIC	
9.	800-035C	CABLE TIE .31X28 8DIA 120LB	
10.	811-178C	HH1/4R1 114 9/16FJIC	Used on 20'
	811-211C	HH1/4R1 084 9/16FJIC	Used on 15'
11.	810-197C	VALVE,SEQUENCE SHOEMAKER	
12.	802-014C	HHCS 3/8-16X3/4 GR5	
13.	804-013C	WASHER LOCK SPRING 3/8 PLT	

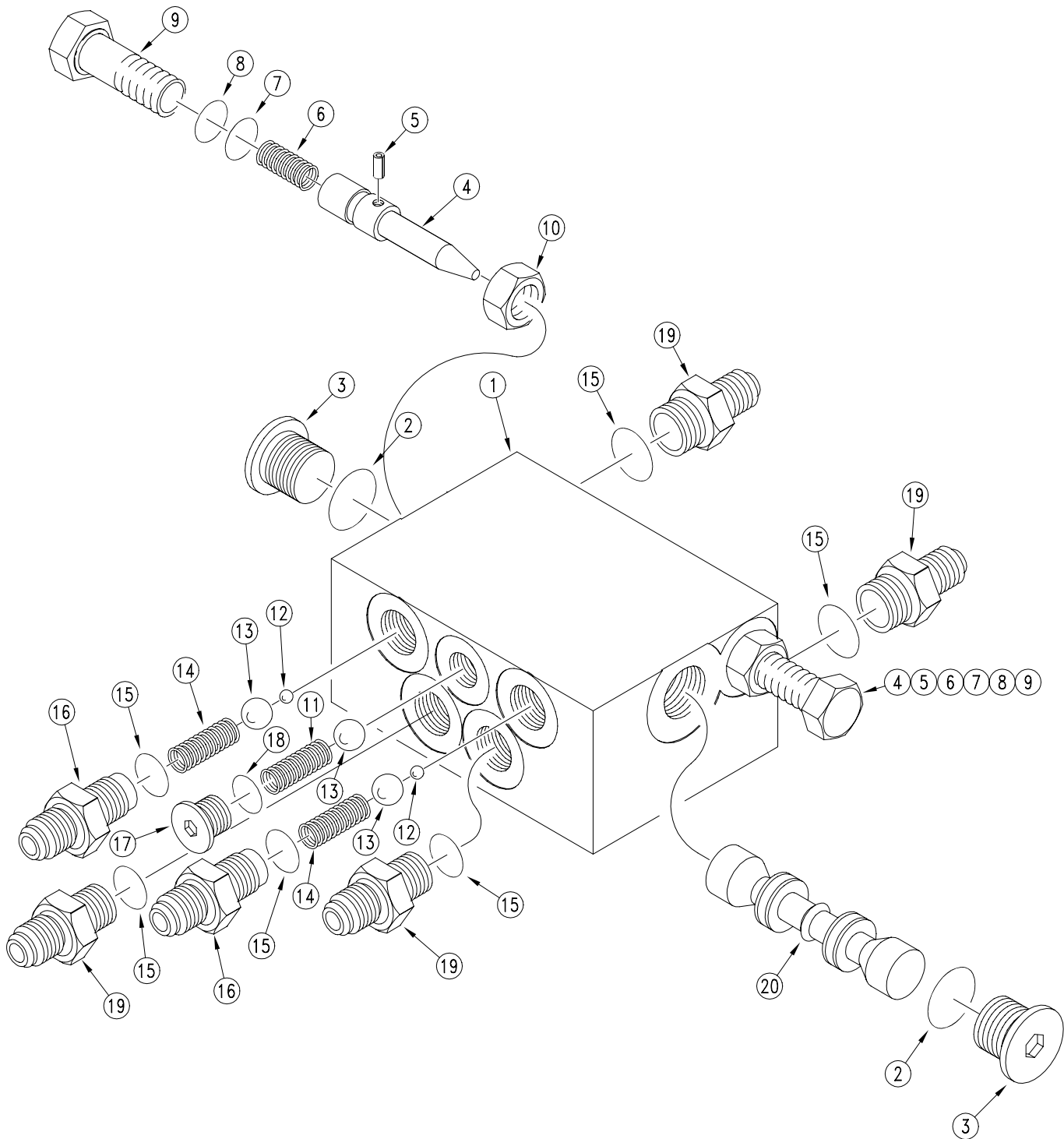
Hydraulic Cylinder (810-196C)



Ref.	Part No.	Description
1.	2A0022	PISTON NUT
2.	4M3102	PISTON
3.	*	BACK-UP
4.	*	O-RING
5.	3R0310	MW HEAD
6.	2A0012	TIE ROD NUT
7.	*	O-RING
8.	*	BACK-UP
9.	*	WIPER SEAL
10.	2M3393	MW ROD
11.	5M3118	TUBE
12.	7M3318	TIE ROD
13.	6R0154	BASE MIDWAY
14.	2A0126	HEX PORT PLUG
15.	810-210C	SEAL KIT

*CAN ONLY BE ORDERED IN SEAL KIT (15)

Sequence Valve (810-197C)






Ref.	Part No.	Description
<hr/>		
1.	3089	BODY, SEQUENCE VALVE
2.	1088-908	O-RING
3.	1132-08	PLUG, HEX SOCKET
4.	1179	NEEDLE, FLOW CONTROL
5.	1217	PIN .125" SPRING PIN
6.	1211	SPRING, COMPRESSION
7.	1088-011	O-RING
8.	1089-011	RING, TEFLON BACK-UP
9.	1180	SCREW, FLOW CONTROL ADJUSTMENT
10.	1218	HEX, JAM NUT ZINC PLATED
11.	1099	SPRING, DETENT
12.	1087-250	CHROMIUM STEEL BALLS
13.	1087-437	CHROMIUM STEEL BALL
14.	1042	SPRING
15.	1088-906	O-RING
16.	1182	FITTING, PORT ADAPTOR
17.	1132-05	HEX, SOCKET O-RING PLUG
18.	1088-905	O-RING
19.	1092-6	CONNECTOR, STRAIGHT
20.	2153	SPOOL, MARKER SEQUENCE .055" ORIFICES






Appendix

Torque Values Chart

Bolt Size (Inches)	Bolt Head Identification					
	 Grade 2		 Grade 5		 Grade 8	
	in·m ²	ft·lb ³	N·m	ft·lb	N·m	ft·lb
in-tpi ¹						
1/4" - 20	7.4	5.6	11	8	16	12
1/4" - 28	8.5	6	13	10	18	14
5/16" - 18	15	11	24	17	33	25
5/16" - 24	17	13	26	19	37	27
3/8" - 16	27	20	42	31	59	44
3/8" - 24	31	22	47	35	67	49
7/16" - 14	43	32	67	49	95	70
7/16" - 20	49	36	75	55	105	78
1/2" - 13	66	49	105	76	145	105
1/2" - 20	75	55	115	85	165	120
9/16" - 12	95	70	150	110	210	155
9/16" - 18	105	79	165	120	235	170
5/8" - 11	130	97	205	150	285	210
5/8" - 18	150	110	230	170	325	240
3/4" - 10	235	170	360	265	510	375
3/4" - 16	260	190	405	295	570	420
7/8" - 9	225	165	585	430	820	605
7/8" - 14	250	185	640	475	905	670
1" - 8	340	250	875	645	1230	910
1" - 12	370	275	955	705	1350	995
1-1/8" - 7	480	355	1080	795	1750	1290
1 1/8" - 12	540	395	1210	890	1960	1440
1 1/4" - 7	680	500	1520	1120	2460	1820
1 1/4" - 12	750	555	1680	1240	2730	2010
1 3/8" - 6	890	655	1990	1470	3230	2380
1 3/8" - 12	1010	745	2270	1670	3680	2710
1 1/2" - 6	1180	870	2640	1950	4290	3160
1 1/2" - 12	1330	980	2970	2190	4820	3560

Torque tolerance + 0%, -15% of torquing values. Unless otherwise specified use torque values listed above.

Bolt Size (Metric)	Bolt Head Identification					
	 Class 5.8		 Class 8.8		 Class 10.9	
	mm x pitch ⁴	N · m	ft-lb	N · m	ft-lb	N · m
M 5 X 0.8	4	3	6	5	9	7
M 6 X 1	7	5	11	8	15	11
M 8 X 1.25	17	12	26	19	36	27
M 8 X 1	18	13	28	21	39	29
M10 X 1.5	33	24	52	39	72	53
M10 X 0.75	39	29	61	45	85	62
M12 X 1.75	58	42	91	67	125	93
M12 X 1.5	60	44	95	70	130	97
M12 X 1	90	66	105	77	145	105
M14 X 2	92	68	145	105	200	150
M14 X 1.5	99	73	155	115	215	160
M16 X 2	145	105	225	165	315	230
M16 X 1.5	155	115	240	180	335	245
M18 X 2.5	195	145	310	230	405	300
M18 X 1.5	220	165	350	260	485	355
M20 X 2.5	280	205	440	325	610	450
M20 X 1.5	310	230	650	480	900	665
M24 X 3	480	355	760	560	1050	780
M24 X 2	525	390	830	610	1150	845
M30 X 3.5	960	705	1510	1120	2100	1550
M30 X 2	1060	785	1680	1240	2320	1710
M36 X 3.5	1730	1270	2650	1950	3660	2700
M36 X 2	1880	1380	2960	2190	4100	3220

¹ in-tpi = nominal thread diameter in inches-threads per inch

² N · m = newton-meters

³ ft-lb = foot pounds

⁴ mm x pitch = nominal thread diameter in millimeters x thread pitch

Warranty

Great Plains Manufacturing, Incorporated warrants to the original purchaser that this seeding equipment will be free from defects in material and workmanship for a period of one year from the date of original purchase when used as intended and under normal service and conditions for personal use; 90 days for commercial or rental purposes. This Warranty is limited to the replacement of any defective part by Great Plains Manufacturing, Incorporated and the installation by the dealer of any such replacement part. Great Plains reserves the right to inspect any equipment or part which are claimed to have been defective in material or workmanship.

This Warranty does not apply to any part or product which in Great Plains' judgement shall have been misused or damaged by accident or lack of normal maintenance or care, or which has been repaired or altered in a way which adversely affects its performance or reliability, or which has been used for a purpose for which the product is not designed. This Warranty shall not apply if the product is towed at a speed in excess of 20 miles per hour.

Claims under this Warranty must be made to the dealer which originally sold the product and all warranty adjustments must be made through such dealer. Great Plains reserves the right to make changes in materials or design of the product at any time without notice.

This Warranty shall not be interpreted to render Great Plains liable for damages of any kind, direct, consequential, or contingent, to property. Furthermore, Great Plains shall not be liable for damages resulting from any cause beyond its reasonable control. This Warranty does not extend to loss of crops, losses caused by harvest delays or any expense or loss for labor, supplies, rental machinery or for any other reason.

No other warranty of any kind whatsoever, express or implied, is made with respect to this sale; and all implied warranties of merchantability and fitness for a particular purpose which exceed the obligations set forth in this written warranty are hereby disclaimed and excluded from this sale.

This Warranty is not valid unless registered with Great Plains Manufacturing, Incorporated within 10 days from the date of original purchase.

Great Plains Manufacturing, Inc.

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