

Great Plains



**2020 SOLID STAND
DRILL**

**FLAT FOLD
MARKER**

OWNER'S MANUAL

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INTRODUCTION

Your 2020 Solid Stand Flat Fold Marker is designed to give you many years of dependable service. This manual has been prepared to instruct you on how to service and keep your marker operating in good condition. Read and follow ALL instructions and safety precautions carefully.

The parts on your 2020 Solid Stand Flat Fold Marker have been specially designed. Should your Flat Fold Marker ever require replacement parts, go to your Great Plains Dealer.

Thank you for buying an Great Plains Flat Fold Marker.

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NUT & BOLT TORQUING CHART

This chart is based on torque requirements in foot pounds for grade 5 bolts.

BOLT DIAMETER	MINIMUM TORQUE	MAXIMUM TORQUE	BOLT DIAMETER	MINIMUM TORQUE	MAXIMUM TORQUE
1/4"	9	11	3/4"	270	324
5/16"	17	20	7/8"	400	480
3/8"	35	42	1"	580	696
7/16"	54	64	1 1/8"	800	880
1/2"	80	96	1 1/4"	1120	1240
9/16"	110	132	1 3/8"	1460	1680
5/8"	150	180	1 1/2"	1940	2200


NOTE: Torque requirements listed above do not apply to self-locking nuts. For self-locking nuts increase torque requirements listed above by 15%.

SAFETY RULES & FEATURES



The **SAFETY ALERT SYMBOL** indicates that there is a potential hazard to personal safety involved and extra safety precautions 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.

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 Flat Fold Marker has been designed with many built-in safety features. However, no one should operate this product before carefully reading this Owner's Manual.

1. **DO NOT** allow anyone near the marker while it is in operation.
2. Excessive speed can cause marker damage.
3. **DO NOT** allow anyone near the grain drill while cycling the markers.
4. Reduce speed while transporting over uneven or rough terrain. Avoid all chuck holes and washboard areas in roads.
5. **DO NOT** lubricate, adjust or repair the marker while it is in operation.
6. When in transport, use accessory lights and devices for adequate warning to operators of other vehicles and use safety chains. Comply with ALL Federal, State and Local Laws when traveling on public roads.
7. **DO NOT** permit smoking, sparks or an open flame where combustible lubricants or liquids are being used.
8.  Escaping fluid under pressure can have sufficient force to penetrate the skin. Check all hydraulic lines and hoses for leaks before applying pressure. Use paper or cardboard and not body parts to check for suspected leaks. If injured seek immediate medical assistance from a doctor familiar with this type of injury.
9. Refer to parts illustration on page 7 for the following instructions. The marker arm (#17) is attached to the marker body with a 3/8" shear bolt (#14). If excessive force is put on the marker during operation, the shear bolt will break allowing the marker arm to swing away thereby reducing the damage that could be caused otherwise. Should this occur, replace the bolt with a 3/8" x 2" long Gr 2 bolt only. {Great Plains part number 802-266C.}

BLEEDING THE HYDRAULICS

1. Be sure tractor hydraulic reservoir is full.
2. With the markers in field position, crack the hydraulic hose fittings located at the base end of the cylinder(s). With your tractor at an idle speed, activate your tractor hydraulic's valve until hydraulic oil seeps out around the hose ends. Tighten the hose end fittings and repeat this process with the hose end fitting(s) located at the rod end of the cylinder(s).
3. Fold and unfold the marker(s) slowly in order to work all the air out of your marker hydraulics.
4. Adjust the speed of the marker with the needle valve, single markers only, to a low setting. Fold the marker up and down a few times and recheck for pinching and kinking of hoses. Reset folding speed with the needle valve to a safe speed.

CYCLING THE MARKERS

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

NOTE: Raising and lowering speed of the markers is due to the internal orifice in the sequence valve necessary for proper operation of the valve spool.

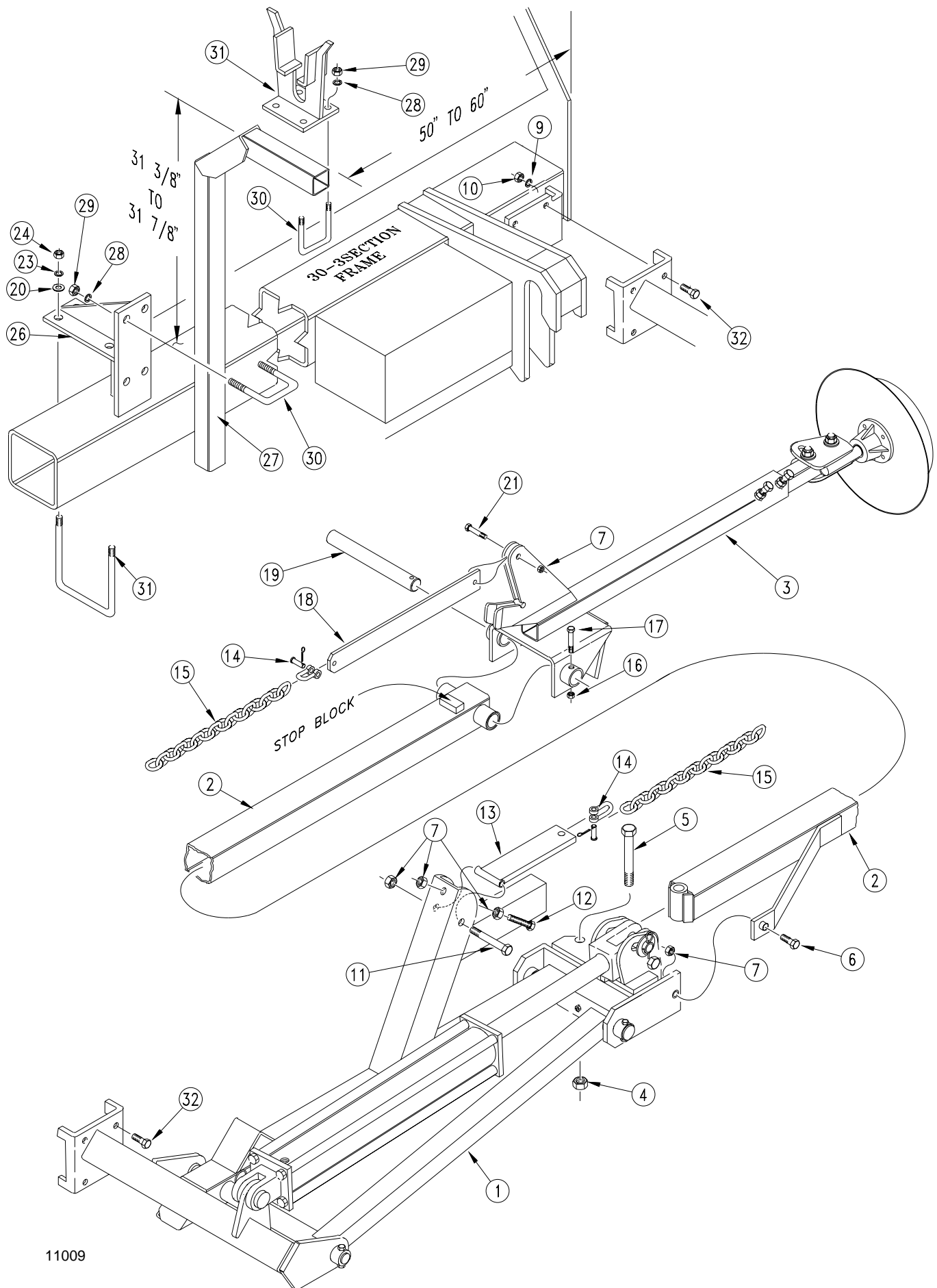


EXCESSIVE SPEED CAN CAUSE MARKER DAMAGE.



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 that is familiar with this type of injury. Foreign fluids in the tissue must be surgically removed within a few hours or gangrene will result.

FLAT FOLD MARKER ASSEMBLY

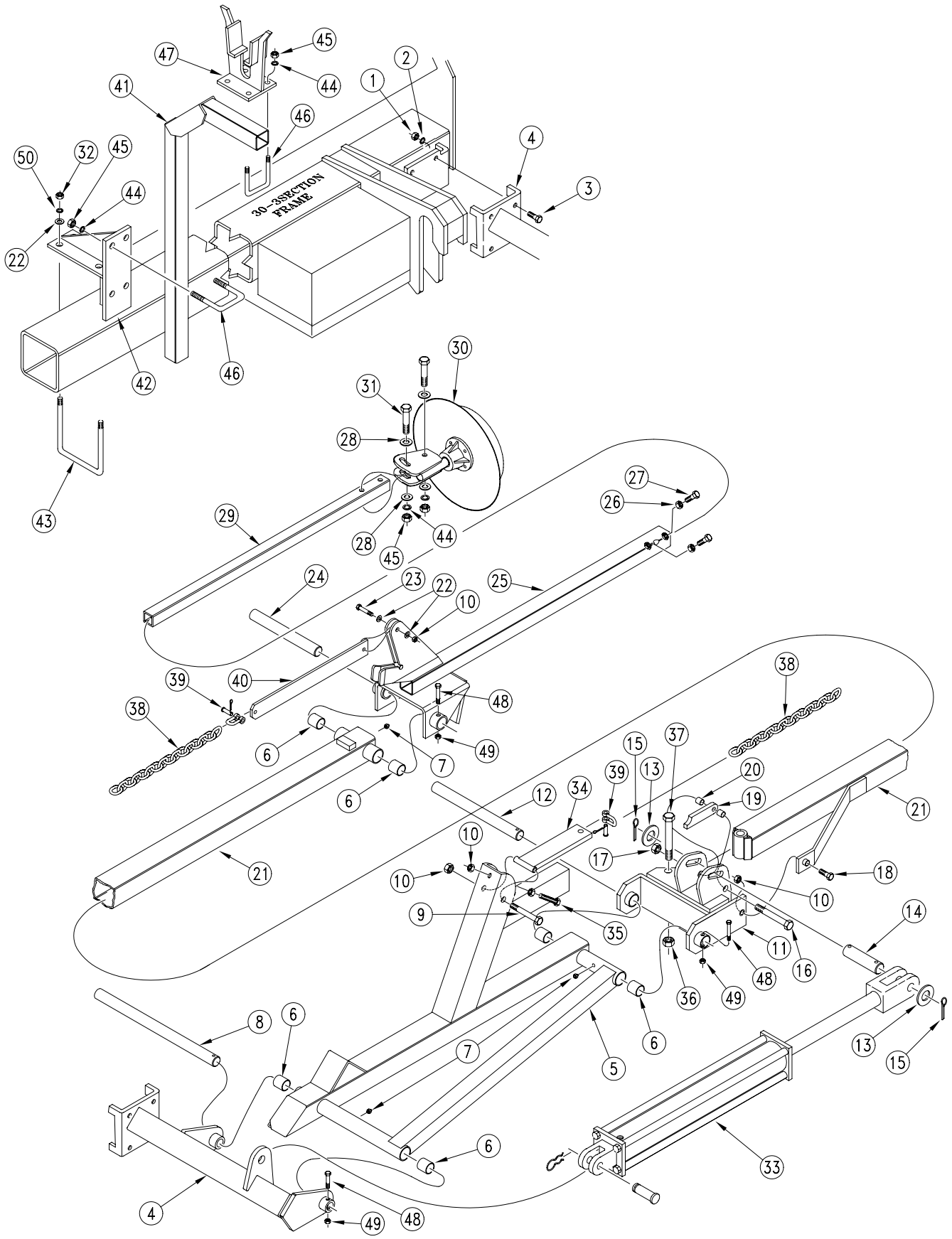


FLAT FOLD MARKER ASSEMBLY INSTRUCTIONS

FOR THE FOLLOWING INSTRUCTIONS, REFER TO THE ILLUSTRATIONS ON PAGE 5:

1. Lower the drill to field position and allow clearance of 16' on drill for marker assembly from each end of the box.
2. Attach the marker first section (#1) to the marker bracket at the end of the drill frame using 5/8" x 2" long bolt (#35), lock washer (#9) and hex nut (#10).
3. Assemble the marker in a horizontal position, remove the port plugs in the hydraulic cylinder to allow the fold cylinder to be extended. Then fold the first section and the lift lug (#1) to a horizontal position.
4. With the stop block position on top of second section (#2) align the holes of the second section with the holes of the first section (#1) and bolt together with the 5/8" x 5 1/2" long bolt (#5), lock nut (#4) 3/8" x 2" long shear bolt (#6) and lock nut (#7).
5. Place the third section (#3) over the end of the second section (#2) and insert the hinge pin (#19) through the second and third section pivot. Secure the hinge pin (#10) with 1/4" x 2" long bolt (#17) and lock nut (#16).
6. Bolt the chain bar weldment (#13) to the first section (#1) with 3/8" x 3 1/4" long bolt (#11), and lock nut (#7). The chain bar weldment (#13) should pivot freely on the 3/8" bolt (#11). Bolt the chain bar (#18) to the third section (#3) with the 3/8" x 1 1/2" long bolt (#21) and lock nut (#7). The chain bar (#18) should pivot freely on the 3/8" bolt (#21). Connect the marker chain (#15) between the chain bar (#18) and chain bar weldment (#13) with 5/16" utility clevis (#14). With the marker disk adjusted for seeding width and disk touching the ground adjust chain length to remove the slack. Adjustment should be made at the utility clevis (#14) nearest to the drill.
7. The purpose of the 3/8" stop bolt (#12) is to hold tension on the marker chain (#15). **ONLY** when the marker is in folding position. Therefore; the 3/8" stop bolt (#12) lock nuts (#7) should be positioned in the lift arm (#1) so the head of the stop bolt extends as little as possible. After marker is folded adjust stop bolt to tighten chain.
8. Mount the marker carrier (#27) with the transport arm mount weldment (#26) using 1/2" x 2" x 3" long u-bolts (#30), lock washers (#28), and hex nuts (#29) approximately 50" to 60" from the outer end of the drill. Clamp the transport arm mount weldment (#23) to the drill frame with 3/8" x 6" x 6 3/4" long u-bolts (#31) flat washers (#20) lock washers (#32) and hex nuts (#33). The carrier arm should be set at 31 3/8" high above the drill frame.
9. Mount the support arm saddle (#34) to the support arm (#27) with 1/2" x 2" x 3" long u-bolts (#30), lock washers (#28) and hex nuts (#29). The support saddle should be centered under the marker chain and the square tube of the second section (#2) when folded to prevent wear. The support arm should support the second section is parallel with the seed box lid. Adjustment can be made by loosening u-bolts that clamp the marker carrier and slide marker carrier up or down to parallel marker with drill box lid.
10. Fold the marker to transport position. With the marker chain (#15) in the slot of the support arm saddle (#34) take up the slack in the marker chain by threading the 3/8" x 2 1/2" long hex bolt (#13) out against the chain bar weldment (#13) lock this stop bolt in position with the two hex nuts (#7).

FLAT FOLD MARKER



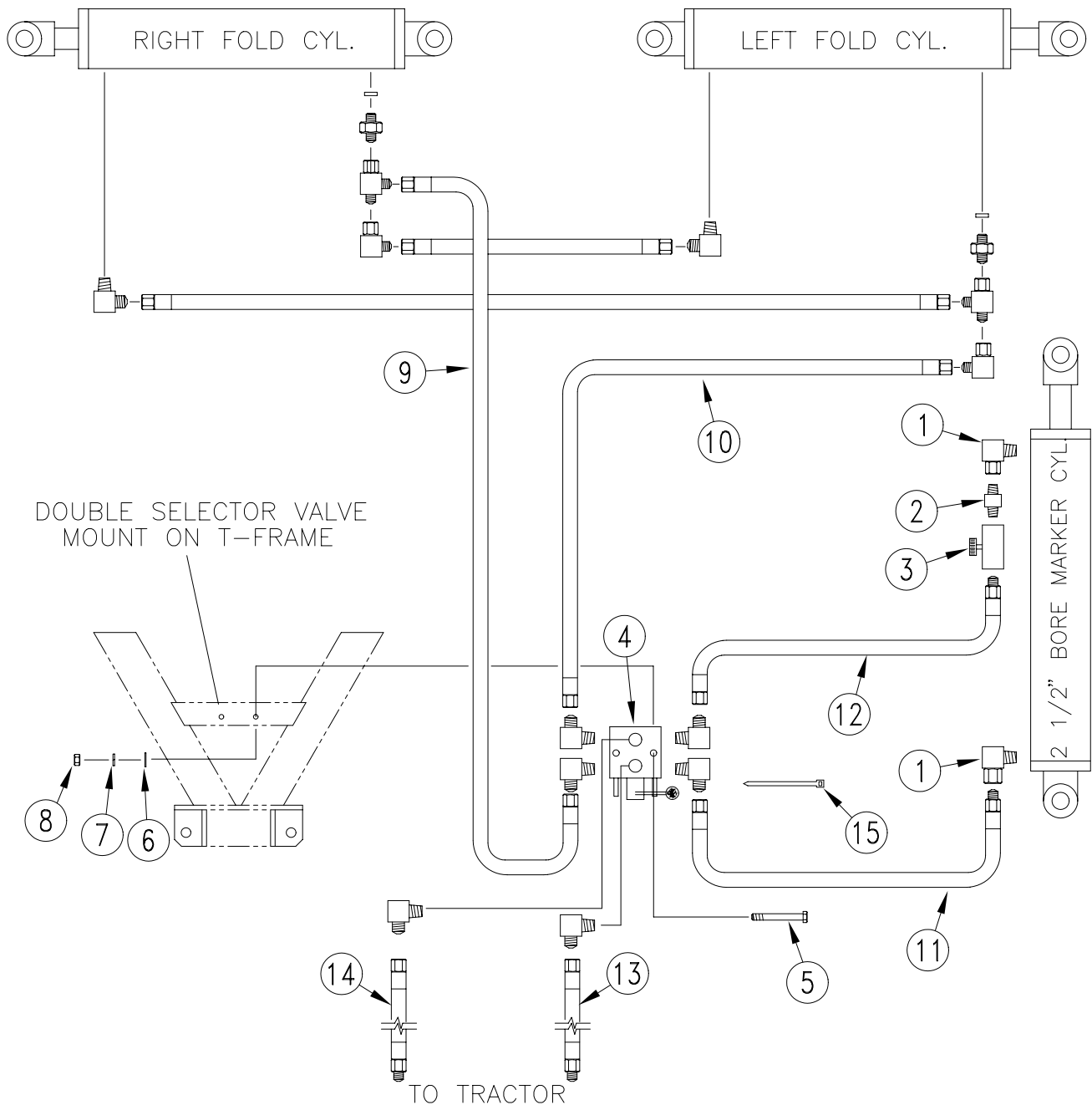
FLAT FOLD MARKER (CON'T.)

Ref.	Part No.	Description
1.	803-021C	Nut, Hex 5/8"-11
2.	804-022C	Washer, Lock Spring 5/8"
3.	802-058C	Bolt, Hex 5/8"-11 x 2 1/2" Long
4.	113-199H	Right Hand Marker Mount
	113-179H	Left Hand Marker Mount
5.	113-188H	Right Hand First Section
	113-180H	Left Hand First Section
6.	890-005C	Bushing, Cylinder 1 1/4" x 1" x 1" Long
7.	800-001C	Zerk, Straight 1/4"-28
8.	113-312D	First Pivot Shaft
9.	802-168C	Bolt, Hex 3/8"-16 x 3 1/4" Long
10.	803-013C	Nut, Lock 3/8"-16
11.	113-189H	Lift Lug Channel Right Hand
	113-181H	Lift Lug Channel Left Hand
12.	113-313D	Second Pivot Shaft
13.	804-029C	Washer, Flat 1"
14.	113-248D	Marker Cylinder Pin Body
15.	805-058C	Pin, Cotter 3/16" x 2"
16.	802-201C	Bolt, Hex Head 1/2"-13 x 4 3/4" Long
17.	803-019C	Nut, Lock 1/2"-13
18.	802-066C	Bolt, Hex 3/8"-16 x 2" Long Gr 2
19.	113-324D	Cylinder Stop
20.	113-325D	Stop Bushing
21.	113-190H	Right Hand Second Section
	113-182H	Left Hand Second Section
22.	804-011C	Washer, Flat 3/8"
23.	802-022C	Bolt, Hex 3/8"-16 x 1 1/2" Long
24.	113-311D	Hinge Pin
25.	113-183H	Marker Third Section
26.	803-036C	Nut, Hex, Jam 1/2"-13
27.	801-054C	Screw, Set, Square Head 1/2"-13 x 1"
28.	804-017C	Washer, Flat 1/2" USS
29.	113-351D	Marker Tube 40 1/2" Long
	113-184H	27' & 30' Marker Tube Weldment
30.	113-305K	Marker Disk, Bearing & Depth Band Assembly
31.	107-111D	Bearing Flange Dust Cover
32.	802-059C	Bolt, Hex 5/8"-11 x 3" Long
33.	810-118C	Cylinder 2 1/2" x 20" x 1 1/4" Rod
34.	113-200H	Chain Bar Weldment
35.	802-261C	Bolt, Hex 3/8"-16 x 2 1/2" Long
36.	803-148C	Nut, Hex Nylock 5/8"-11
37.	802-254C	Bolt, Hex 5/8"-11 x 5 1/2" Long
38.	113-319D	Marker Chain 71" Long
39.	890-018C	Utility Clevis 5/16"
40.	113-323D	Chain Bar
41.	113-197D	Marker Carrier
42.	113-316H	Transport Arm Mount Weldment
43.	113-281H	Blade Adjuster Weldment
44.	804-015C	Washer, Lock Spring 1/2"
45.	803-020C	Nut, Hex 1/2"-13
46.	806-005C	U-Bolt, 1/2"-13 x 2" x 3" Long
47.	113-198H	Support Arm Saddle
48.	802-152C	Bolt, Hex 1/4"-20 x 2" Long
49.	803-007C	Nut, Lock 1/4"-20
50.	806-060C	U-Bolt, 1/2"-13 x 6 1/32" x 7 1/4" Long
51.	802-041C	Bolt, Hex 1/2"-13 x 3 1/2" Long
52.	803-008C	Nut, Hex 5/16"-18
53.	804-009C	Washer, Lock 5/16"
54.	113-304H	Marker Depth Band Weldment
55.	800-010C	Rivet, Button Head 3/16" x 9/16" Long
56.	107-110D	Ribbed Bearing Flange
57.	188-001V	Bearing AA 205 DO
58.	820-083C	Marker Disk
59.	113-303S	Marker Disk & Bearing Assembly
60.	802-092C	Bolt, Carriage 5/16"-18 x 3/4" Long Gr 5

SINGLE FLAT FOLD MARKER HYDRAULIC ASSEMBLY INSTRUCTIONS

1. Attach fittings (#16) & (#18) to cylinder ports. Attach the needle valve (#14) & (#15) to the cylinder fittings as show below. Bolt selector valve (#11) to the selector valve mount on T-Frame with 3/8" x 3" long bolts (#20), flat washers (#21) lock washer (#22) and nut (#23). Route the hydraulic hoses (#7) & (#10) from the fold hydraulic cylinders and marker hydraulic cylinders (hoses (#14) & (#15)) to the selector valve as shown in illustration. Route hydraulic hoses (#24) & (#25) from the tractor, through the drill tongue to the selector valve. Secure the hydraulic hoses to the frame with plastic tie straps (#13) to prevent kinking and pinching during folding operations.

SINGLE MARKER HYDRAULICS



SINGLE MARKER HYDRAULICS

Ref.	Part No.	Description
1.	810-065C	Cylinder 3 1/2" x 24" x 1 1/2" Rod
2.	811-172C	Hydraulic Fitting 1/16" Orifice Plate
3.	811-133C	Hydraulic Fitting 3/4" O-RING x 9/16" JICM
4.	811-061C	Hydraulic Fitting 6 JIC M x 6 JIC F Tee
5.	811-169C	Hydraulic Fitting 3/8" M-F Elbow
6.	811-171C	Hydraulic Fitting -8 MORB x -6 JIC M Elbow
7.	811-056C	Hydraulic Hose 3/8" x 42 R1
8.	811-307C	Hydraulic Hose 1/4" x 108 R1
9.	811-308C	Hydraulic Hose 1/4" x 54 R1
10.	811-309C	Hydraulic Hose 1/4" x 66 R1
11.	810-023C	Double Selector Valve
12.	811-134C	Hydraulic Fitting 9/16" JIC x 1/2" MNPT 90
13.	800-082C	Cable Tie
14.	811-035C	Hydraulic Hose, 1/4" x 21' Long
15.	811-293C	Hydraulic Hose, 1/4" x 272" Long
16.	811-301C	Hydraulic Fitting 1/2" MNPT x 3/8" Swivel 90 Degree
17.	810-058C	Needle Valve 3/8"
18.	811-044C	Hydraulic Fitting 3/8" NPT Close Nipple
19.	810-118C	Hydraulic Cylinder 2 1/2" x 20" Stroke
20.	802-024C	Bolt, Hex Head 3/8"-16 x 3" Long
21.	804-013C	Washer, Lock Spring 3/8"
22.	804-011C	Washer, Flat 3/8" USS
23.	803-014C	Nut, Hex 3/8"-16
24.	811-306C	Hydraulic Hose 1/4" x 360 R1
25.	811-305C	Hydraulic Hose 1/4" x 336 R1
26.	810-019C	Hydraulic Cylinder 3" x 20" Stroke
27.	811-214C	Hydraulic Fitting 1/2" MNPT x 3/8" FNPT 90 Degree Street L
28.	811-213C	Hydraulic Fitting 1/2" MNPT x 3/8" MNPT 90 Degree Elbow

DUAL FLAT FOLD MARKER HYDRAULIC ASSEMBLY INSTRUCTIONS

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.

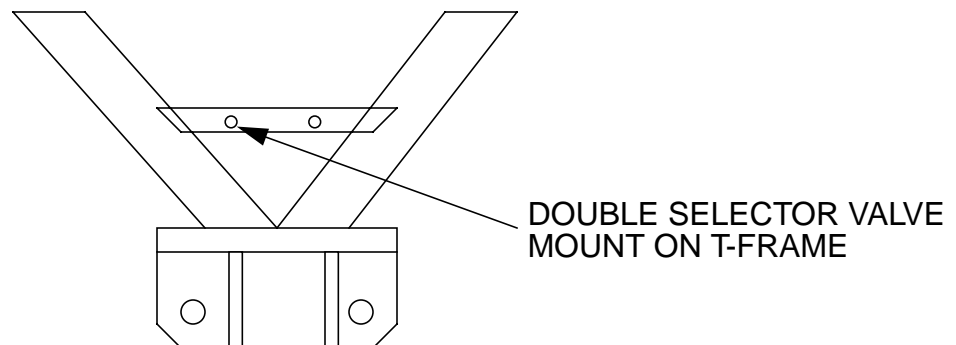
Refer to figure below and page 13 for the following instructions:

1. Attach the selector / sequence valve to the selector valve mount the T-Frame (#11) using 3/8" bolts (#20) flat washers (#22) lock washers (#21) and hex nuts (#23).
2. Route hoses from the selector / sequence valve down the drill box frame tube. Check hose routing for pinching and kinking of hoses and securely attach with plastic cable ties (#13).
3. Attach hoses to cylinder ports. Be certain to double check for correct port location back to the sequence valve.
4. Detach existing tractor hoses (#18) & (#19) from fold cylinders. Attach 66" hose (#10) and 42" hose (#7) and tractor hoses (#18) & (#19) to selector / sequence valve (#11) and wing cylinders. Assemble remaining hoses as indicated.

IMPORTANT! BEFORE CONTINUING WITH THESE INSTRUCTIONS, READ "BLEEDING THE HYDRAULICS" INSTRUCTIONS ON PAGE 4. BLEED ALL THE AIR OUT OF THE HYDRAULIC SYSTEM BEFORE FOLDING THE MARKER.

5. Cycle marker as instructed on page 4.
6. When ready to fold wing boxes for transporting, position the handle on the selector/sequence valve towards the port marked "G". Hydraulic oil is now diverted to the fold cylinders

NOTE: Raising and lowering speed of the markers is due to the internal orifice in the sequence valve necessary for proper operation of the valve spool.



EXCESSIVE SPEED CAN CAUSE MARKER DAMAGE.



DO NOT ALLOW ANYONE NEAR THE DRILL WHEN CYCLING THE MARKER!

NOTE: To avoid cracking the hydraulic pipe fittings, **DO NOT** use plastic sealant tape. Use liquid sealant to seal hydraulic pipe fittings only.

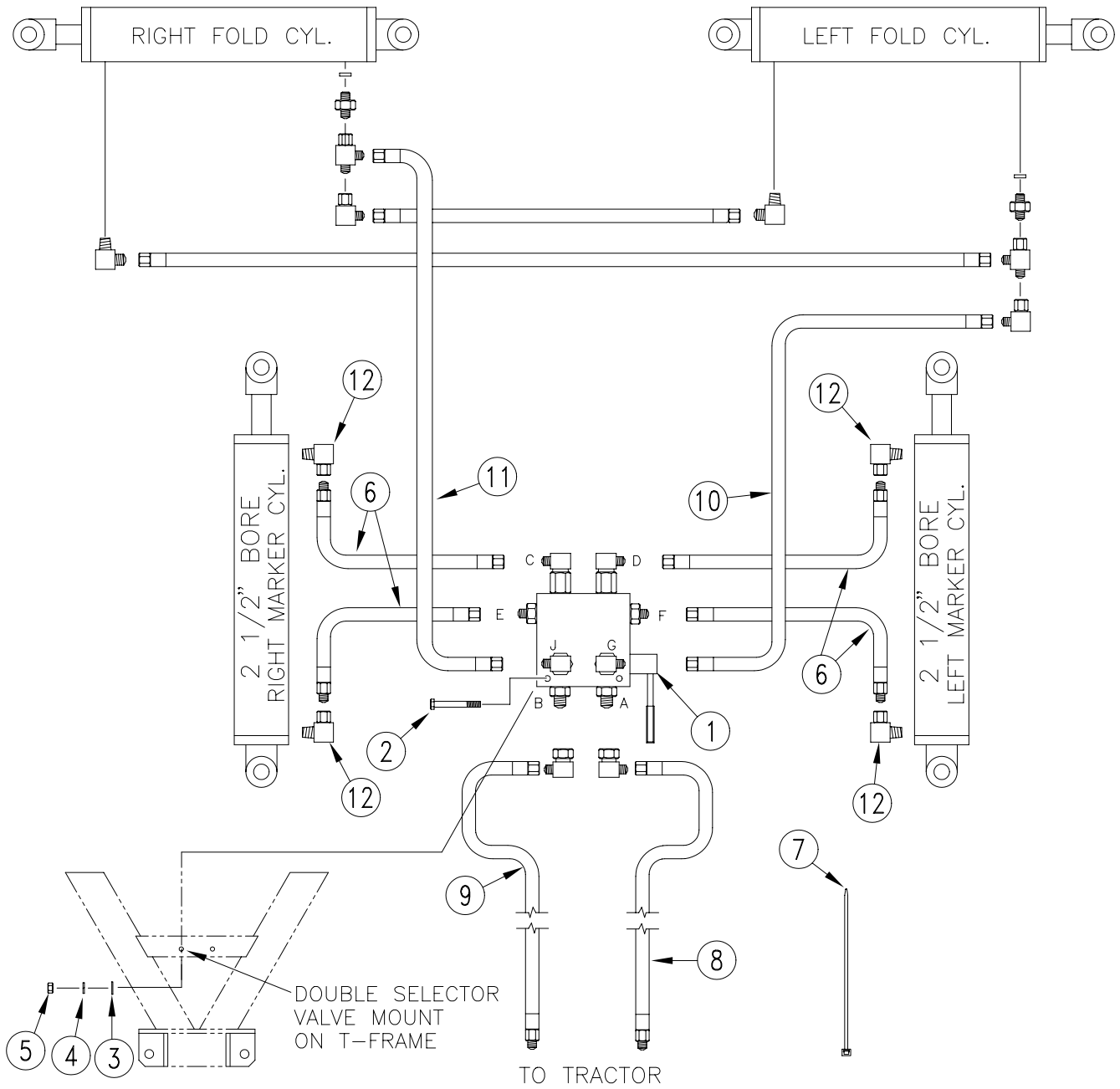
FLAT FOLD MARKER

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PARTS BOOK

DUAL MARKER HYDRAULICS



DUAL MARKER HYDRAULICS (CON'T)

Ref.	Part No.	Description
1.	810-065C	Cylinder 3 1/2" x 24" x 1 1/2" Rod
2.	811-172C	Hydraulic Fitting 1/16" Orifice Plate
3.	811-133C	Hydraulic Fitting 3/4" O-RING x 9/16" JICM
4.	811-061C	Hydraulic Fitting 6 JIC M x 6 JIC F Tee
5.	811-169C	Hydraulic Fitting 3/8" M-F Elbow
6.	811-171C	Hydraulic Fitting -8 MORB x -6 JIC M Elbow
7.	811-056C	Hydraulic Hose 3/8" x 42 R1
8.	811-307C	Hydraulic Hose 1/4" x 108 R1
9.	811-308C	Hydraulic Hose 1/4" x 54 R1
10.	811-309C	Hydraulic Hose 1/4" x 66 R1
11.	810-085C	Selector/Sequence Valve
12.	811-250C	Hydraulic Fitting -8 JICF x -6 JICM Elbow (Pre July 1990)
	811-319C	Hydraulic Fitting -6 JICF x -6 JICM Swivel Elbow
13.	800-082C	Cable Tie
14.	811-035C	Hydraulic Hose, 1/4" x 21' Long
15.	811-293C	Hydraulic Hose, 1/4" x 272" Long
16.	811-281C	Hydraulic Fitting 3/8" FNPT Swivel x 9/16" MORB
17.	810-118C	Hydraulic Cylinder 2 1/2" x 20" Stroke
18.	811-306C	Hydraulic Hose 1/4" x 360 R1
19.	811-305C	Hydraulic Hose 1/4" x 336 R1
20.	802-024C	Bolt, Hex Head 3/8"-16 x 3" Long
21.	804-013C	Washer, Lock Spring 3/8"
22.	804-011C	Washer, Flat 3/8" USS
23.	803-014C	Nut, Hex 3/8"-16
24.	810-019C	Hydraulic Cylinder 3" x 20" Stroke
25.	811-301C	Hydraulic Fitting 1/2" MNPT x 3/8" FNPT 90 Degree Swivel

SERVICE

Keep marker adequately lubricated. Use a heavy duty multipurpose grease for lubrication.

Recommended Greasing - every 20 - 25 Hours.

Lubrication Points:

2 - Zerks on right and left hand first section (#5)

WARRANTY

Great Plains warrants to the original purchaser of new Great Plains Products, that they are free of defects in material and workmanship. This warranty is applicable only for the normal life expectancy of the unit or individual components for a period of one year from date of original purchase if for personal use; 90 days for commercial or rental purposes. Warranty coverage is limited to replacing any part, at no charge to the original purchaser, that in our judgment shows evidence of a defect: provided that upon written request, any such defective part is returned to Great Plains within (30) days of failure.

This Warranty does not apply to any part or product which in Great Plains's judgment 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.

Claims under this Warranty must be made to the dealer which originally sold the product. 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 any expense due to 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.