HINIKER

MODELS 4831, 4832, & 4833
AIR SEEDER CART WITH
4800 AIR SEEDER
FRONT FOLDING TOOLBAR
S/N - 102

ASSEMBLY MANUAL

DO NOT USE OR OPERATE THIS EQUIPMENT UNTIL THIS MANUAL HAS BEEN READ AND THOROUGHLY UNDERSTOOD

PART NUMBER 8054785

JM-22-0000368

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8054785 01/2000 FN #1023,#E1060

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SAFETY

THIS IS THE SAFETY ALERT SYMBOL. IT ALERTS AN OPERATOR TO INFORMATION CONCERNING PERSONAL SAFETY. ALWAYS OBSERVE AND HEED THESE SYMBOLS AND INSTRUCTIONS, OTHERWISE DEATH OR SERIOUS INJURY CAN RESULT!

Operator safety is a principle concern in equipment design and distribution. However, many accidents occur because a few seconds of thought, and a more careful approach to handling, were ignored.

ACCIDENTS CAN BE AVOIDED BY KNOWING, AND FOLLOWING, THE PRECAUTIONS CITED IN THIS MANUAL.

For better viewing, certain photos may show a safety shield open or removed. This equipment should never be operated without factory installed shields in place.

Replace any decals that are not readable, or missing. Their ordering numbers and proper location are shown in the DECAL LOCATION section of the operators manual. Keep decals free of dirt, grease, etc.

Throughout this manual, and on all safety related decals, a safety alert symbol along with the signal word **CAUTION, WARNING, or DANGER** will be found. These are defined as follows:

CAUTION: A REMINDER FOR PROPER SAFETY PRACTICES AND DIRECTS ATTENTION TO FOLLOWING THEM. DECALS OF THIS CLASS ARE YELLOW AND BLACK.

WARNING: A REMINDER FOR PROPER SAFETY PRACTICES AND WHAT CAN HAPPEN IF THEY ARE IGNORED. THIS HAS A MORE SERIOUS CONSEQUENCE THAN CAUTION. DECALS OF THIS CLASS ARE ORANGE AND BLACK.

DANGER: DENOTES A MOST SERIOUS SAFETY HAZARD. IT IS A REMINDER FOR OBSERVING THE STATED PRECAUTIONS AND WHAT CAN HAPPEN IF THEY ARE IGNORED. DECALS OF THIS CLASS ARE RED AND WHITE.

There are other decals and copy in this manual that pertain to protecting the equipment. They are not directly related to operator safety. These have black letters on a white background to distinguish them from safety decals. They lack the safety alert symbol, but carry the words NOTICE or **IMPORTANT** defined as follows:

IMPORTANT: Warns the reader of potentially more serious machine damage, or poor performance if ignored.

NOTICE: INFORMS THE READER OF SOMETHING THAT CAN CAUSE MINOR MACHINE DAMAGE, OR POOR PERFORMANCE IF IGNORED.

GENERAL

1. Additional copies of this manual are available from your HINIKER dealer. If you sell this equipment, ensure that the new owner acknowledges receipt of the operators manual.

2. Read this manual thoroughly. Make sure the operator understands it and knows how to assemble and operate this equip-

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ment safely. Farm equipment can kill or injure an untrained, or careless operator.

3. Do not attempt to handle and service this equipment, or direct others to do the same, unless you know how to do it safely.

4. Keep all shields and guards in place.

5. Keep hands, feet, hair and clothing away from moving parts.

6. STOP tractor engine, set brakes and wait for all motion to stop before adjusting, or servicing this equipment.

7. Keep off, keep others off, and ensure everyone is clear before starting, actuating hydraulics, and during equipment operation.

8. Do not service or otherwise handle a 4800 Air Seeder in a raised position unless it is securely blocked against falling.

9. Escaping hydraulic/diesel fluid under pressure can penetrate the skin causing serious injury.

   - DO NOT use your hand to check for leaks. Use a piece of cardboard.
   - Stop tractor and relieve pressure before connecting/disconnecting lines.
   - Tighten all connections before pressurizing hydraulic lines.
   - If fluid is injected into the skin, get medical attention immediately to prevent serious infection.

10. Discipline yourself to always visually inspect this equipment for any excessively worn, damaged, or cracked parts before starting use. Replace these with genuine HINIKER parts.

11. OSHA requires farm employers to meet certain safety standards. Become familiar with, and comply with them.

12. Watch where you are going. Note all hazards and obstructions such as ditches, overhead electrical wires, narrow gates, etc. When transporting and/or operating the machine, Refer to page 52 of the operators manual for transport height and width specifications.

13. Reduce tractor speed when transporting over uneven or rough terrain.

14. When transporting down steep hills or slopes, shift tractor into lower gear.

15. Do not alter this equipment to the extent of compromising safety and performance.

16. Do not substantially operate tractor in a closed building.

17. Agricultural chemicals can be dangerous. Always follow the manufacturer's label safety precautions when using them.

18. Do not assume everyone is as safety conscious as yourself.

BEFORE OPERATION

1. NEVER allow improperly supervised minors, or anyone else, to operate this equipment. It is your responsibility to ensure that any operator is mentally and physically capable of doing so.

2. Do not "jump start" the tractor from along side it. Start tractor only from seat.

3. Never operate wing lift cylinders on folding models without (4) restrictor fittings, one at each end of lift cylinders.

DURING OPERATION

1. Stop tractor engine, remove key and allow EQUIPMENT TO COME TO A COMPLETE STOP before:

   - Cleaning, unclogging, lubricating, inspecting, or otherwise servicing, any part of this equipment.
   - Connecting or disconnecting the cultivator from the tractor.
   - Allowing anyone else near the equipment.
   - Dismounting from the tractor seat and parking the equipment.

2. Never operate 4800 Air Seeder without having safety chain properly in place between tractor and trailer.

3. Never ride or permit others to ride on tractor drawbar or on machine; nor allow anyone other than yourself on the tractor while in operation.

4. Check all controls and operating functions of the machine in a safe area before starting to work.

5. Never fold toolbar wings forward when others are standing on the trailer or catwalk.

6. Before disconnecting lines, be sure to relieve all pressures to the system.

TOWING

1. When towing on public highways:

   - Use a tractor of sufficient size, and weight, required for field operation.

   - Do not transport faster than 25 MPH (40 kph).

2. Keep away from overhead power lines. Serious injury or death may result. Know transport height and width of your machine.

3. Always fold wings fully and close transport lock-up valve.

4. Latch tractor brakes together.

5. Shift the tractor into a lower gear when transporting down steep slopes or hills. Stop slowly.

6. Keep the SMV emblem and reflectors clean and visible from the rear.

7. Make sure the amber reflectors are clean and visible from the front.

8. Use headlights, flashing warning lights and turn signals day and night. Follow local regulations for equipment lighting and marking. Keep lighting and markings visible and in good working order.

SERVICE

1. Service information herein is intended for dealers and others correspondingly competent. If you are not experienced and/or capable of handling such service, do not attempt it.

2. Stop tractor engine, remove key and allow EQUIPMENT TO COME TO A COMPLETE STOP before:

   - Cleaning, unclogging, lubricating, inspecting, or otherwise servicing, any part of this equipment.

   - Connecting or disconnecting the field cultivator from the tractor.

   - Allowing anyone else near the equipment.

3. Securely support any machine element that must be raised for service work.

4. Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any build up of grease, oil, or debris.

REMEMBER-ACCIDENT PREVENTION IS PART OF YOUR JOB!

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ASSEMBLY

RECOMMENDED TORQUE VALUES

The torque values given in Table 1 are valid for standard zinc coated and lubricated fasteners assembled in rigid joints.

Fasteners which are waxed or phosphate coated or cadmium coated or specially lubricated should be torqued to lubricate torque values below.

A ± 20 percent tolerance is to be used when a single value torque is specified.

All references to left and right, front and rear apply to the machine as viewed from the rear looking in the direction of travel.

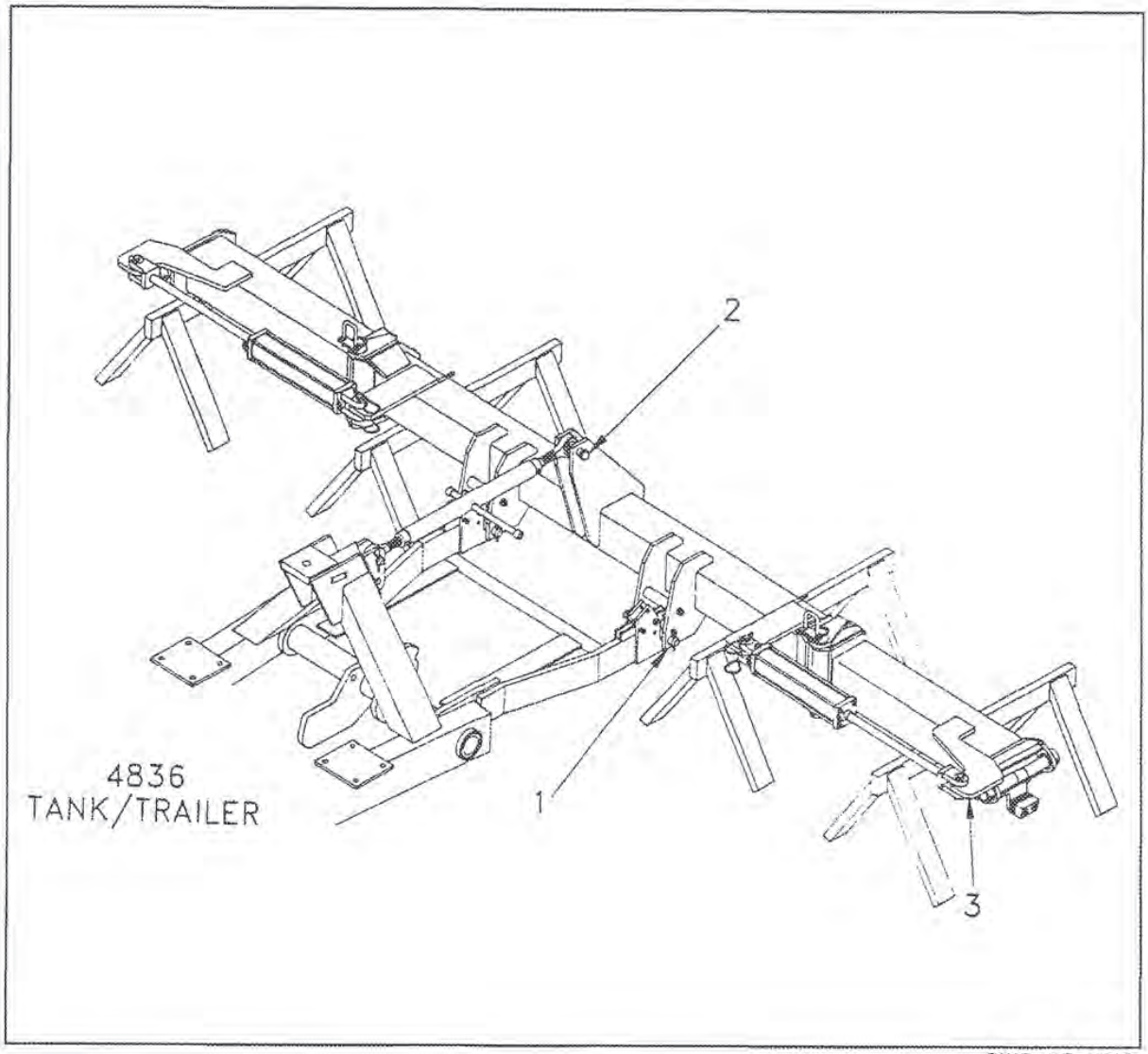
TABLE 1 - RECOMMENDED TORQUE VALUES FOR INCH FASTENERS (ZINC COATING & LUBRICATED)**

Nominal Size	SAE 2 Not Recommended For New Design lbf - ft		SAE 5 120 000 psi Min Tensile Str lbf - ft		SAE 8 150 000 psi Min Tensile Str lbf - ft	
	Dry	Lubricated	Dry	Lubricated	Dry	Lubricated
1/4-20	6	4	8	6	12	9
1/4-28	6	5	10	7	14	10
5/16-18	11	8	17	13	25	18
5/16-24	12	9	19	14	25	20
3/8-16	20	15	30	23	45	35
3/8-24	23	17	35	25	50	35
7/16-14	30	24	50	35	70	55
7/16-20	35	25	55	40	80	60
1/2-13	50	35	75	55	110	80
1/2-20	55	40	90	65	120	90
9/16-12	70	55	110	80	150	110
9/16-18	80	60	120	90	170	130
5/8-11	100	75	150	110	220	170
5/8-18	110	85	170	130	240	180
3/4-10	175	130	260	200	380	280
3/4-16	195	145	300	220	420	320
7/8-9	165	125	430	320	600	460
7/8-14	185	140	470	350	660	500
1-8	250	190	640	480	900	680
1-12	270	200	700	500	1000	740
1 1/8-7	350	270	800	600	1280	960
1 1/8-12	400	300	880	660	1440	1080
1 1/4-7	500	380	1120	840	1820	1360
1 1/4-12	550	420	1240	920	2000	1500
1 3/8-6	660	490	1460	1100	2380	1780
1 3/8-12	740	560	1680	1260	2720	2040
1 1/2-6	870	650	1940	1460	3160	2360
1 1/2-12	980	730	2200	1640	3560	2660

** MACHINE DESIGN FASTENER AND JOINT REFERENCE ISSUE.

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DWG. NO. 3748

STEP 1

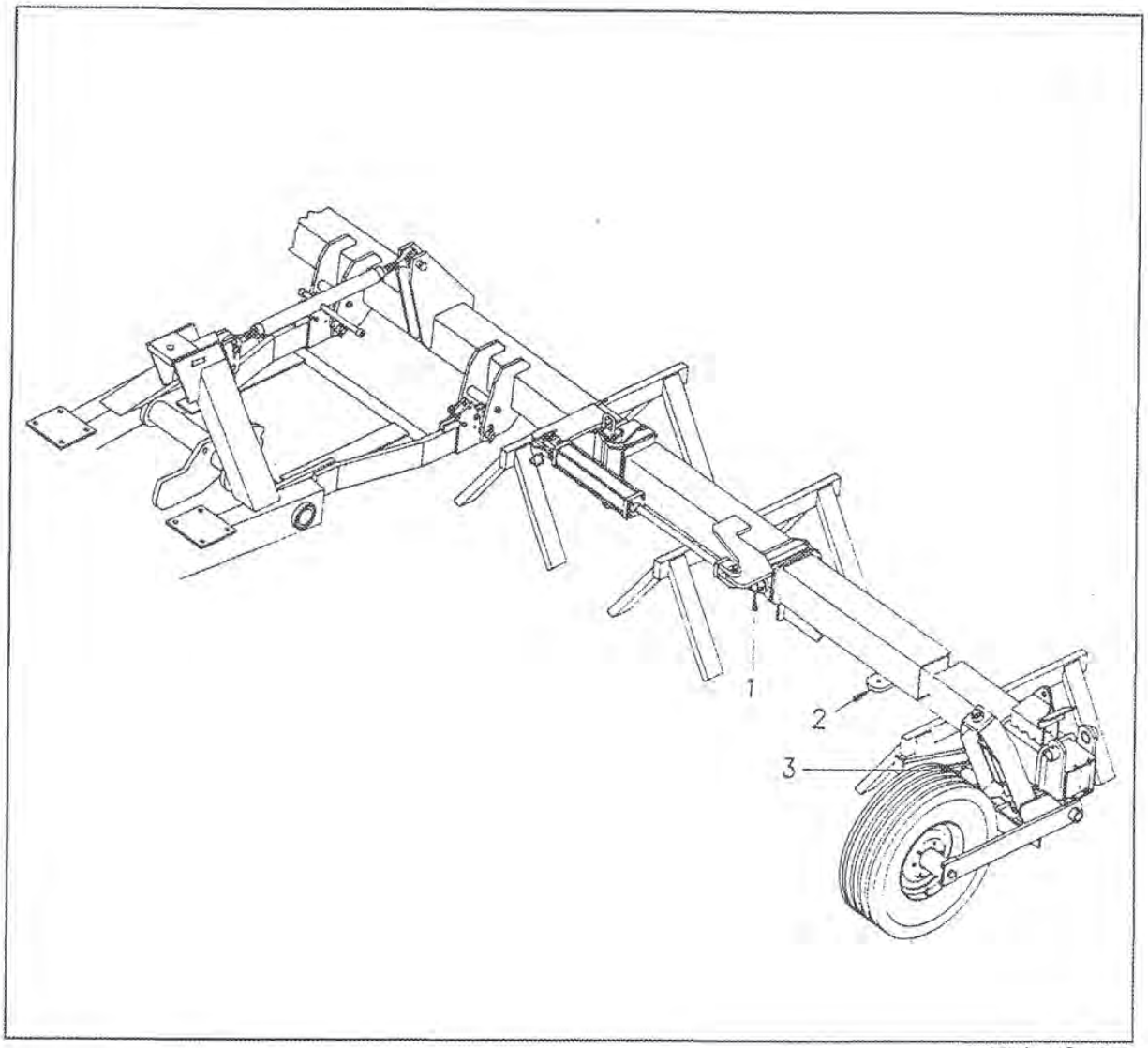
Place center toolbar on stands, holding it 19 inches off floor. Attach 3-point hitch members from 4836 tank/trailer assembly to center tooltbar hitch plate using hitch pin provided. (arrow 1 and 2).

STEP 2

Place both inner wings inline with center toolbar as shown in drawing.

STEP 3

Extend wing fold cylinder and attach to inner wing toolbar (arrow 3) using pin provided.



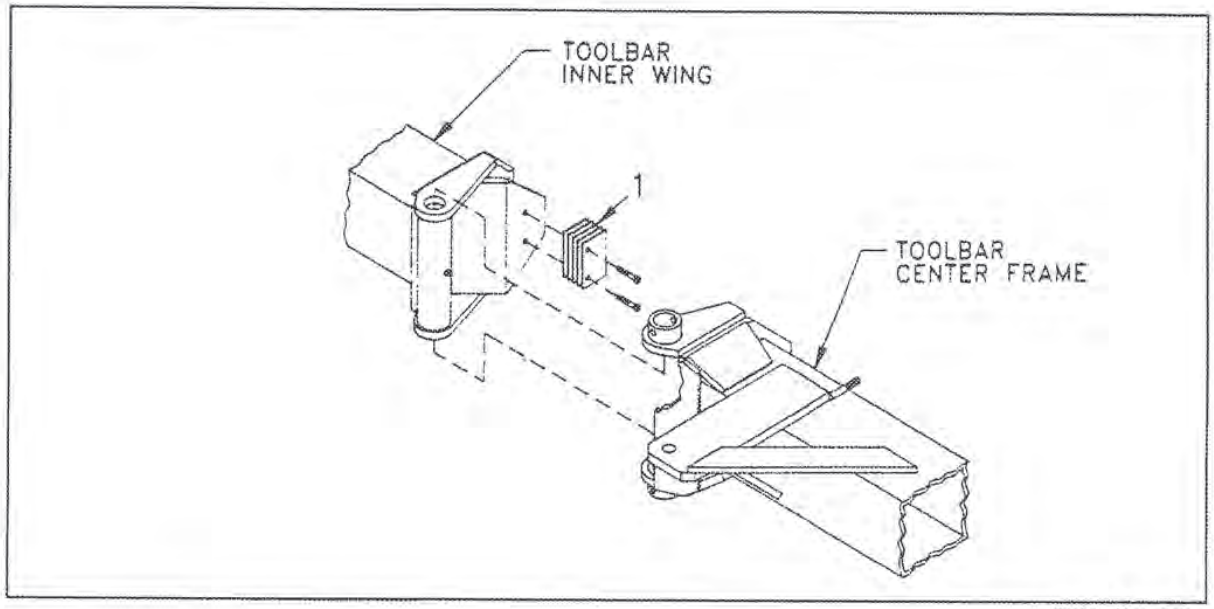
DWG. NO. 3749

STEP 4

Install both outer wings using pivot pin (arrow 1). **NOTE:** Drag link anchor (arrow 2) must be installed to front as shown in drawing.

STEP 5

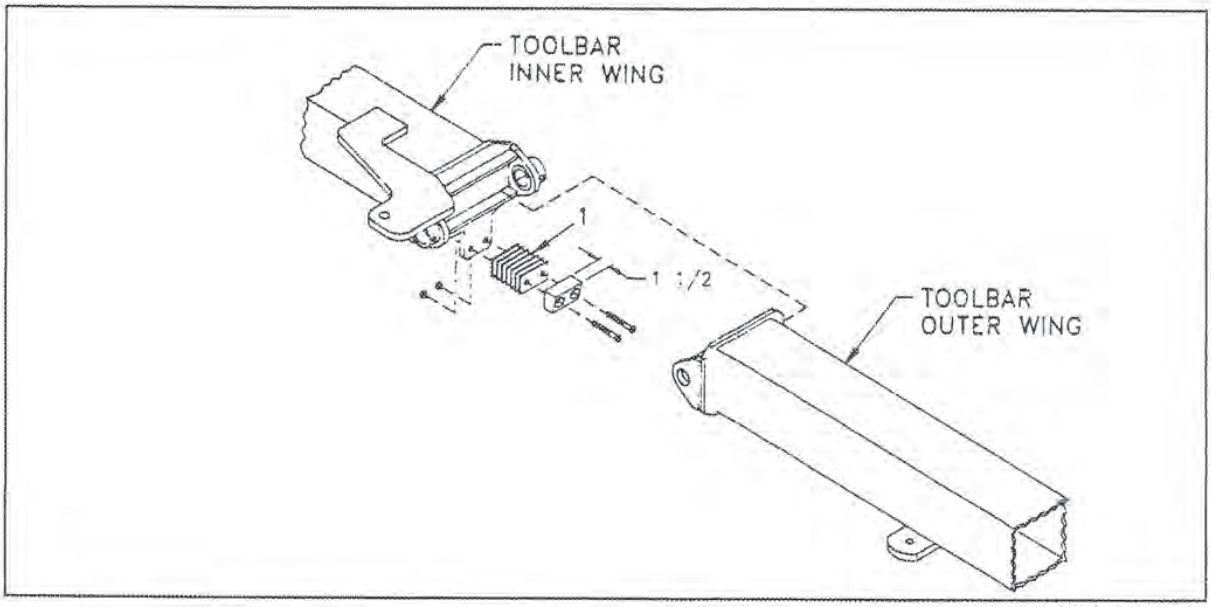
Install left and right wing wheel lift.
NOTE: The roller lock (arrow 3) must be installed on inside. Install 3/4" u-bolt (arrow 4). Use the Assembly Diagrams for proper placement of Wheel Lift & Toolbar Guide for your model size and row spacing. (Refer to pages 21-23.)



DWG. NO. 3624

STEP 6

Check for proper toolbar alignment between center frame and both inner wings. Adjust number of shims (arrow 1) as required.



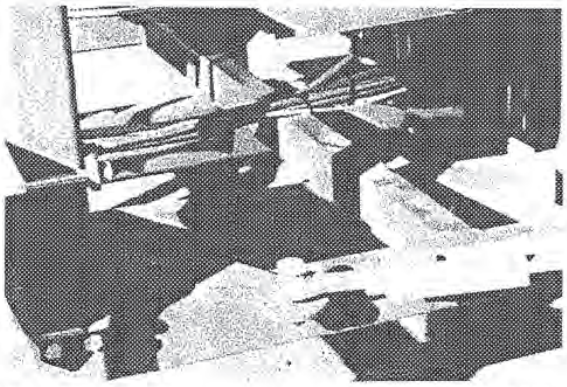
DWG. NO. 3623

Step 7

Adjust for the number of shims (arrow 1) between inner wings and outer wing.

Note: Use (4) shims for 15 inch rows and use (7) shims for 10 inch row spacing.

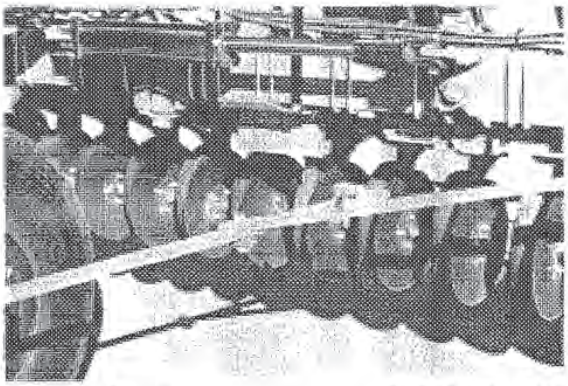
STEP 8



Left Hand Shown PHOTO NO. 4075

Install front drag link using 1 inch hex bolt provided mounting on top of trailer. Pull strap as shown. Correct drag link eyebolt dimension is 73 3/4" from center of 1" bolt through eye to center of 3/4 bolt at the pivot connection.

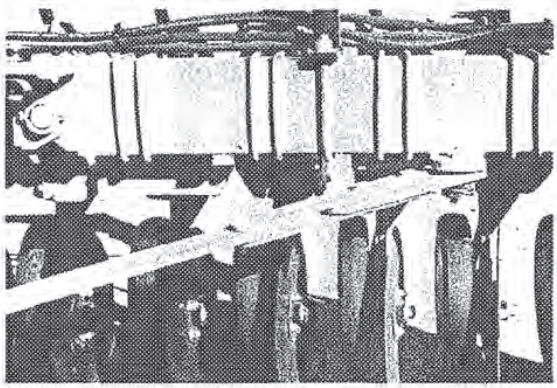
STEP 9



Left Hand Shown PHOTO NO. 4057

When installing drag link assembly the middle pivot and lock must be installed as shown, with Belleville washer on bottom and lock on top.

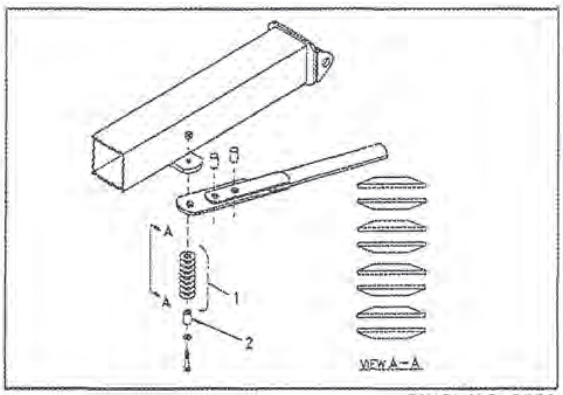
STEP 10



Right Hand Shown PHOTO NO. 4088

Install rear drag link to toolbar outer wing anchor strap as shown. **NOTE:** Position of drag link under anchor strap and Belleville washer under drag link.

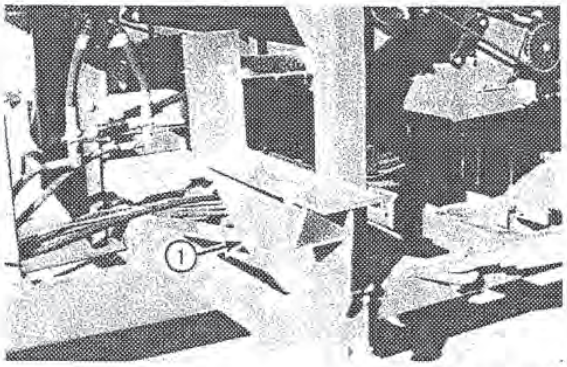
STEP 11



DWG. NO. 3750

When installing Belleville washer (arrow 1). **NOTE:** Position of washers to have the beveled sides together as shown in enlarged view. Also, tighten bolt down on spacer (arrow 2). At that point, the Belleville washer will be at proper tension.

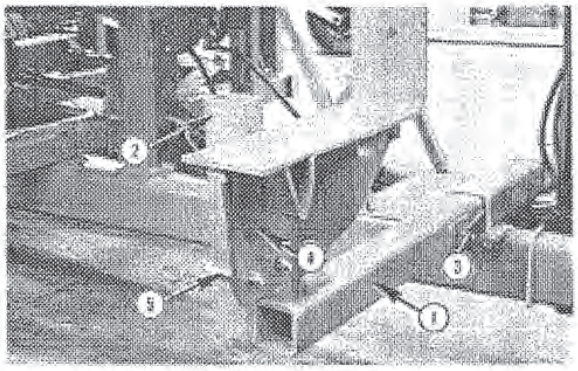
STEP 12A
(30 Ft. Toolbar)



Left Hand Shown PHOTO NO. 4051

Reinstall right and left hand wing rest (arrow 1) mounted to the front tank posts using existing 5/8 u-bolts, lockwashers and hex nuts.

STEP 12B
(40 Ft. Toolbar)



Right Hand Shown PHOTO NO. 3943A

Install front cross tube weld (arrow 1), center it on trailer tongue. **NOTE:** Position of vertical 3 x 4 tube (arrow 2) mounts to the rear. Install (2) 5/8 bolts (arrow 3) using lockwasher and hex nuts. Reinstall right and left hand wing rest (arrow 4) to the front cross tube, using original (2) 5/8 u-bolt (arrow 5) with lockwashers and hex nuts.

STEP 13

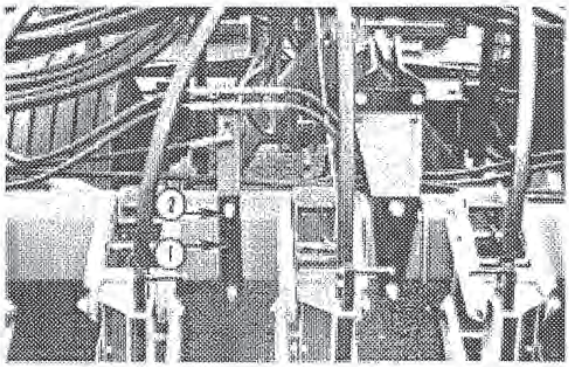
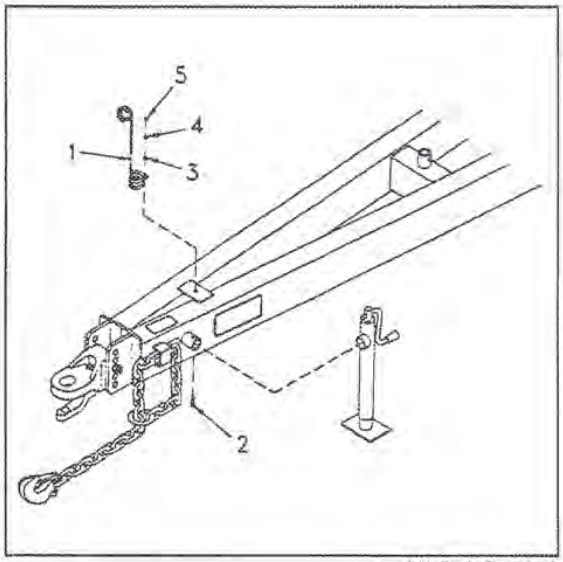


PHOTO NO. 3966

Install bulkhead plate (arrow 1) using 5/8 u-bolt (arrow 2) with lockwasher and hex nuts. **NOTE:** Bulkhead plate mounts left of center and between two 4800 disc opener units.

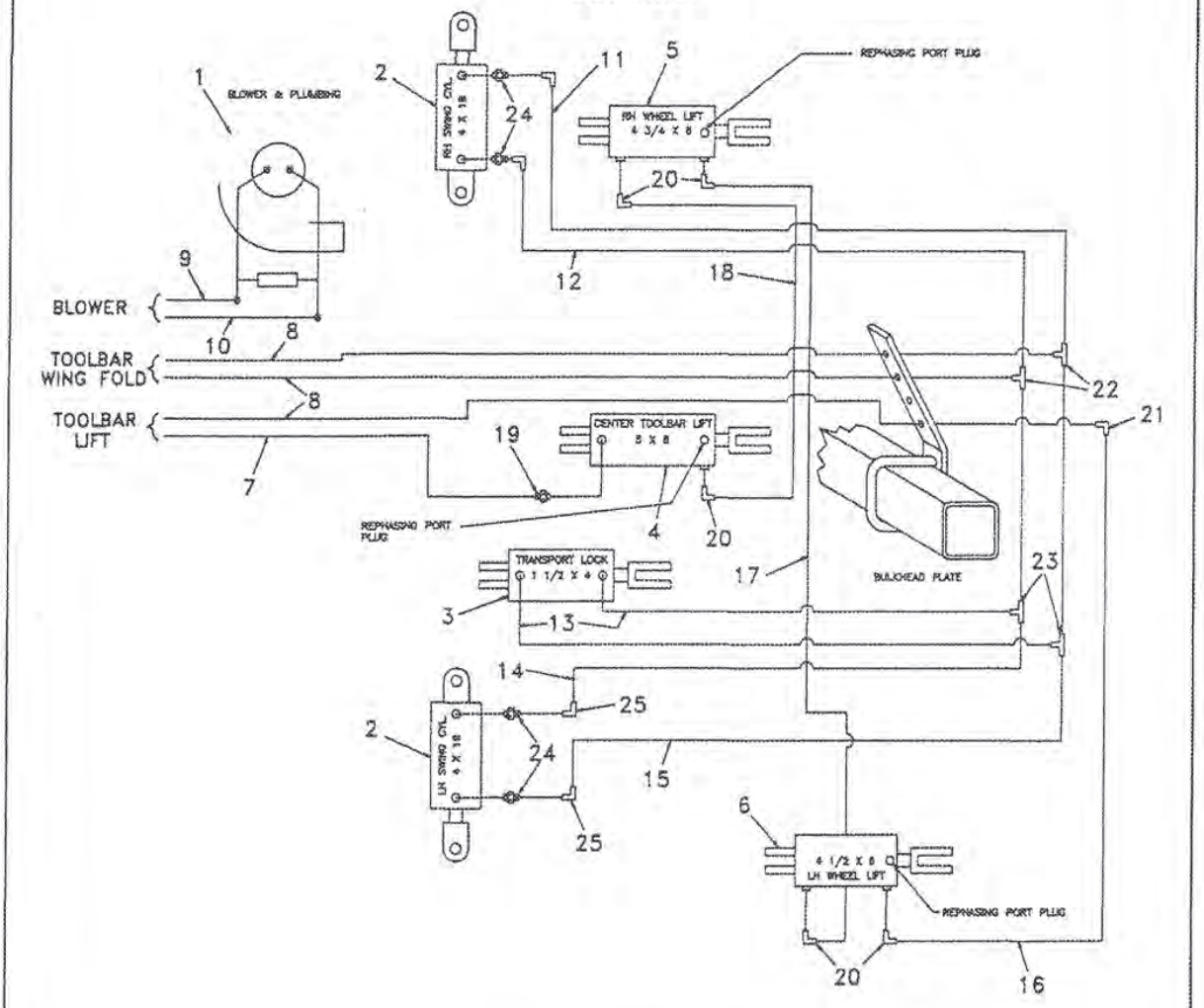


DWG. NO. 3659

Reinstall front hose stand (arrow 1), from cat walk step. Using (1) 1/2 x 1 1/2 hex bolt (arrow 2) with 1/2 flatwasher (arrow 3), 1/2 lockwasher (arrow 4) and 1/2 hex nut (arrow 5).

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HYDRAULIC PLUMBING DIAGRAM



DWG. NO. 3751

REF. NO.	PART NUMBER	DESCRIPTION	QTY	REF. NO.	PART NUMBER	DESCRIPTION	QTY
1	80305265	Blower & Plumbing Assembly	1	16	957-001-034	Hose Assy 3/8 x 180" 30° Toolbar	1
2	81004342	4 x 16 Cylinder Assembly	2		957-001-074	Hose Assy 3/8 x 240" 40° Toolbar	1
3	624001	HYD Cylinder 1 1/2 x 4	1	17	957-001-072	Hose Assy 3/8 x 378" 30° Toolbar	1
4	80305383	5 x 8 Cylinder	1		957-001-076	Hose Assy 3/8 x 498" 40° Tooolbar	1
5	80305385	4 3/4 x 8 Cylinder	1	18	957-001-073	Hose Assy 3/8 x 288" 30° Toolbar	1
6	80305384	4 1/2 x 8 Cylinder	1		957-001-075	Hose Assy 3/8 x 348" 40° Toolbar	1
7	957-004-015	Hose Assy 3/8 x 264"	1	19	956-003-001	STR-ADPT 9/16 MJIC x 3/4 MORB w/o Restrictor	1
8	957-004-014	Hose Assy 3/8 x 318"	3				
9	957-009-011	Hose Assy 1/2 x 200"	1	20	956-005-001-	Fitting-Elbow 90° 9/16 MJIC x 3/4 MORB	5
10	957-009-010	Hose Assy 1/2 x 210"	1	21	956-006-002	Fitting-Bulkhead Elbow 90° 9/16 MJIC x 9/16 MJIC	1
11	957-001-018	Hose Assy 3/8 x 79"	1				
12	957-001-013	Hose Assy 3/8 x 59"	1	22	956-007-003	Fitting-Bulkhead Tee 9/16 MJIC x 9/16 MJIC x 9/16 MJIC	2
13	957-002-020	Hose Assy 3/8 x 66"	2				
14	957-001-071	Hose Assy 3/8 x 36"	1	23	956-007-010	Fitting Tee 9/16 FJIC x 9/16 MJIC x 9/16 MJIC	2
15	957-001-061	Hose Assy 3/8 x 56"	1	24	956-008-024	Restrictor Fitting 3/4 MORB x 9/16 MJIC	4
				25	956-005-002	Fitting-Elbow 90° 9/16 MJIC x 9/16 FJIC	4

JM-22-0000379

STEP 14

HYDRAULIC SYSTEM INSTALLATION

WARNING: TO PREVENT PERSONAL INJURY OR DEATH. ESCAPING HYDRAULIC/DIESEL FLUID UNDER PRESSURE CAN PENETRATE THE SKIN CAUSING SERIOUS INJURY.

- **DO NOT use your hand to check for leaks. Use a piece of cardboard.**
- **Stop tractor and relieve pressure before connecting/disconnecting lines.**
- **Tighten all connections before pressurizing hydraulic lines.**
- **If fluid is injected into the skin, get medical attention immediately to prevent serious infections.**

IMPORTANT: Cleanliness is very important when working in the hydraulic system. Prevent contamination by assembling the cylinders, hoses, couplers and valves in a clean area of the shop.

Leave protective caps on the fluid openings until ready to make the connection. When charging the system, use a tractor or other source that contains clean oil, free of abrasive materials. Keep couplers clean. abrasive particles, like sand or metal fragments, can damage seals, barrels and pistons, causing internal leakage.

Refer to illustration on page 13 for proper assembly and installation of hydraulic lines and fittings.

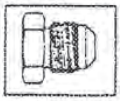
Refer to pages 14-16 for proper assembly and installation of optional hydraulic row markers and fill augers.

NOTE: Thread sealant is to be used on the pipe threads going into the male hydraulic tips that connect to the tractor. The thread sealant must be compatible with the hydraulic systems.

Secure all hydraulic connections in accordance with hydraulic fitting installation procedures and the torque table.

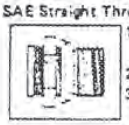
HYDRAULIC FITTING INSTALLATION PROCEDURES AND TORQUE TABLE

SAE Flare Connection



1) Tighten nut finger tight until it bottoms the seat.
2) Using a wrench, rotate nut to tighten. Turn nut 1/3 turn to apply proper torque.

SAE Straight Thread "O" Ring Seal



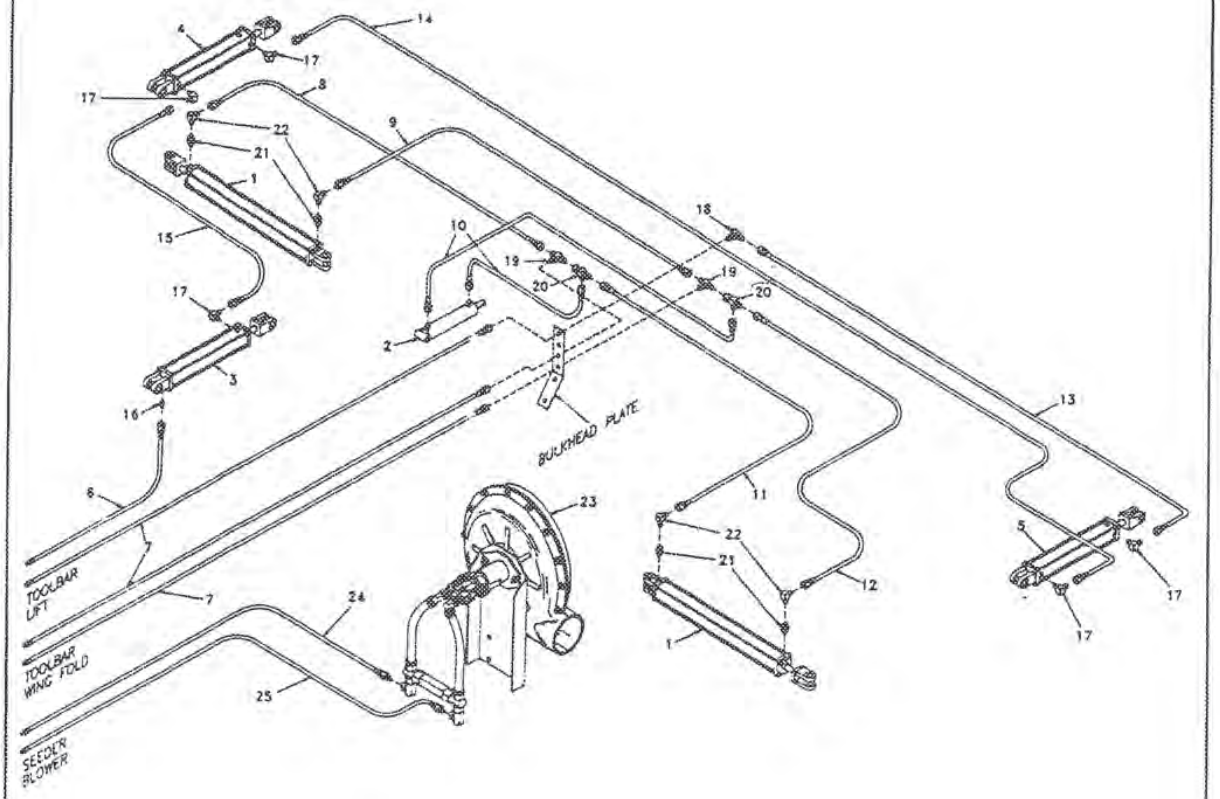
1) Insure jam nut and washer are backed up to the back side of smooth portion of elbow adapter.
2) Lubricate "O" Ring-VERY IMPORTANT!
3) Thread into port until washer bottoms onto spot face.
4) Position elbows by backing up adapter.
5) Tighten jam nut.

DWG. NO. 1966

Hiniker does not supply quick connect hydraulic couplings with the 4836 Air Seeder. Use couplers that match the customer's tractor outlets. ISO quick connect couplers are the most common style.

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HYDRAULIC HOSE ASSEMBLY

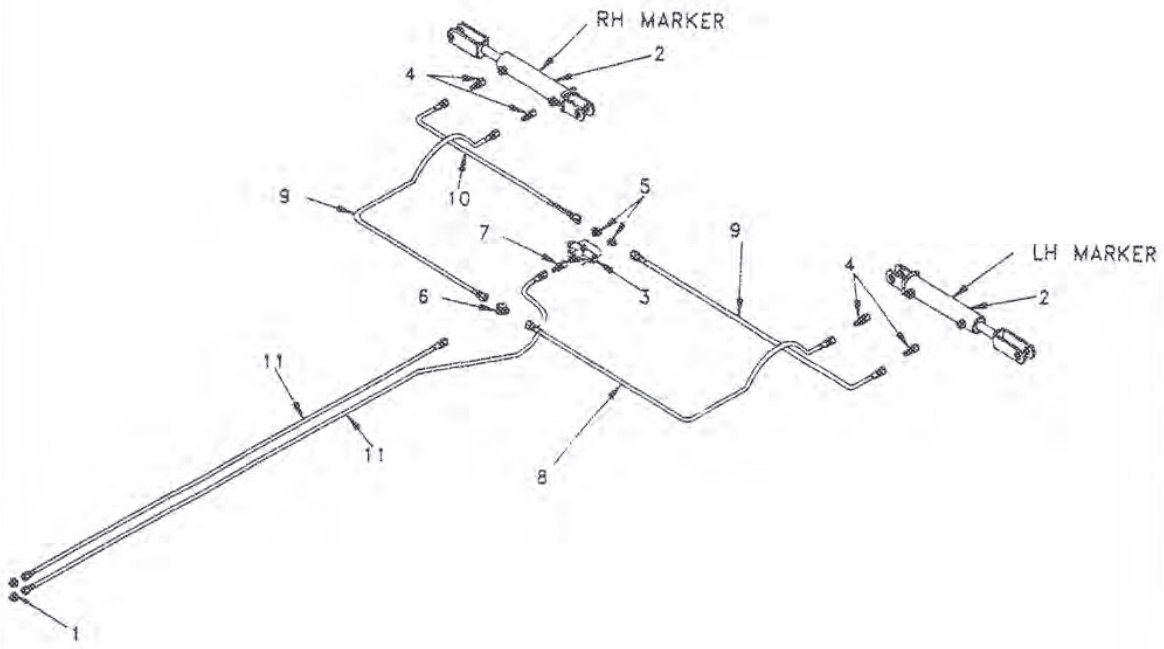


DWG. NO. 3653A

REF. NO.	PART NUMBER	DESCRIPTION	QTY.	REF. NO.	PART NUMBER	DESCRIPTION	QTY.
1	81004342	4 x 16 Cylinder Assy	2	15	957-001-073	Hose Assy 3/8 x 288" 30' Toolbar	1
2	624001	1 1/2 x 4 HYD Cylinder	1		957-001-075	Hose Assy 3/8 x 348" 40' Toolbar	1
3	80305383	5 x 8 Cylinder	1	16	956-003-001	STR-ADPT 9/16 MJIC x 3/4 MORB w/o Restictor	1
4	80305385	4 3/4 x 8 Cylinder	1				
5	80305384	4 1/2 x 8 Cylinder	1	17	956-005-001	Fitting Elbow 90° 9/16 MJIC x 3/4 MORB	5
6	957-004-015	Hose Assy 3/8 x 264"	1	18	956-006-002	Fitting-Bulkhead Elbow 90° 9/16 MJIC x 9/16 MJIC	1
7	957-004-014	Hose Assy 3/8 x 318"	3				
8	957-001-018	Hose Assy 3/8 x 79"	1	19	956-007-003	Fitting-Bulkhead Tee 9/16 MJIC x 9/16 MJIC x 9/16 MJIC	2
9	957-001-013	Hose Assy 3/8 x 59"	1				
10	957-002-020	Hose Assy 3/8 x 66"	2	20	956-007-010	Fitting Tee 9/16 FJIC x 9/16 MJIC x 9/16 MJIC	2
11	957-001-071	Hose Assy 3/8 x 36"	1	21	956-008-024	Restrictor Fitting 3/4 MORB x 9/16 MJIC	4
12	957-001-061	Hose Assy 3/8 x 56"	1	22	956-005-002	Fitting-Elbow 90° 9/16 MJIC x 9/16 FJIC	4
13	957-001-034	Hose Assy 3/8 x 180" 30' Toolbar	1	23	80305265	Blower & Mount Assy	1
	957-001-074	Hose Assy 3/8 x 240" 40' Toolbar	1	24	957-009-011	Hose Assy 1/2 x 200"	1
14	957-001-072	Hose Assy 3/8 x 378" 30' Toolbar	1	25	957-009-010	Hose Assy 1/2 x 210"	1
	957-001-076	Hose Assy 3/8 x 498" 40' Toolbar					

JM-22-0000381

OPTIONAL HYDRAULICS
MARKERS

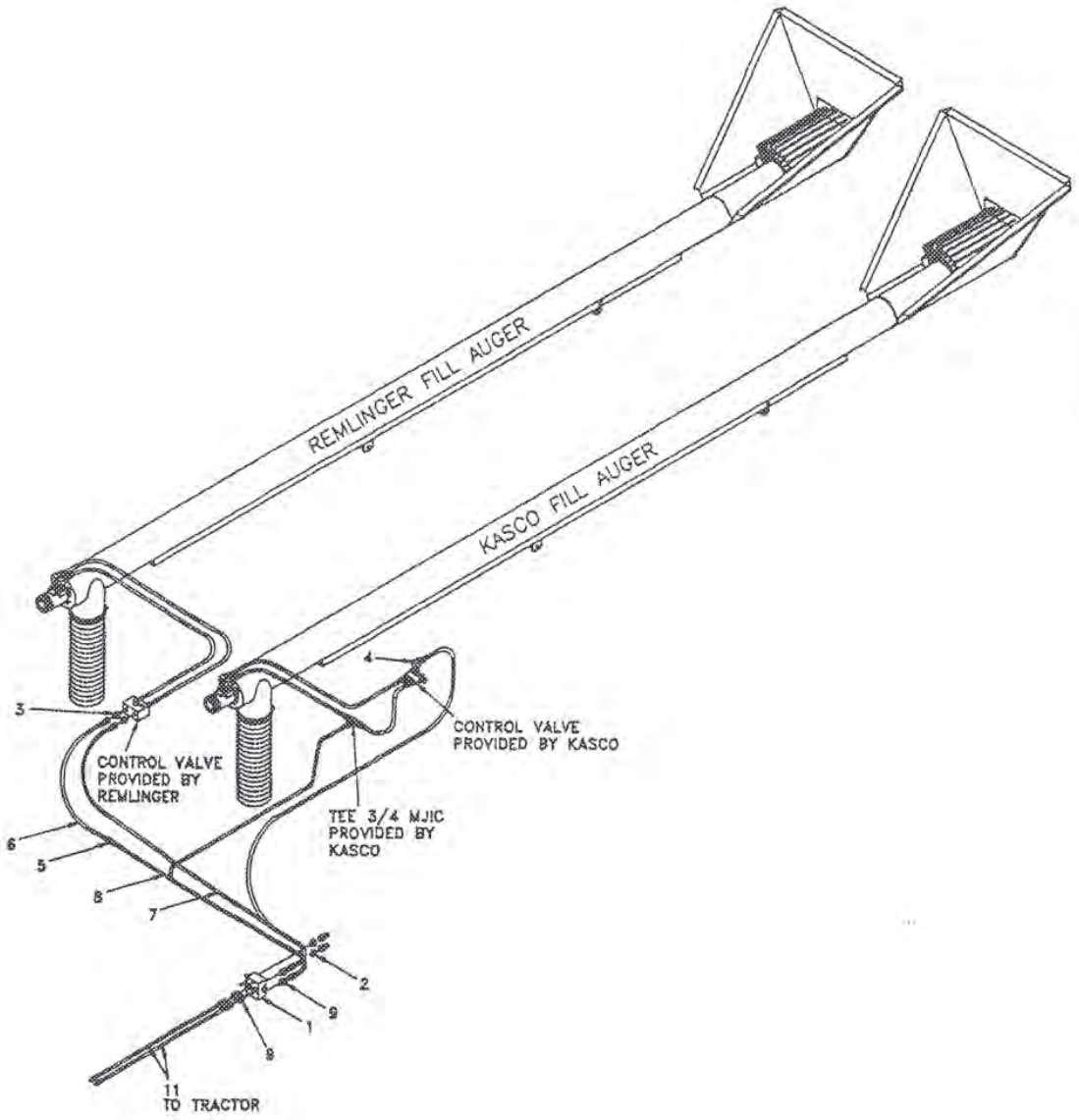


HINIKER P/N 80305585, 80305586 DWG. NO. 3777

REF. NO.	PART NUMBER	DESCRIPTION	QTY.	REF. NO.	PART NUMBER	DESCRIPTION	QTY.
1	957-004-014		2	8	957-001-074	40' Hose Assy 3/8 x 240"	1
2	624129	2 1/2 x 24 CYL Assy PMC #AR-265	2		957-001-074	30' Hose Assy 3/8 x 240"	1
3	805-003-026	Sequence Valve	1	9	957-001-079	40' Hose Assy 3/8 x 260"	2
4	956-008-024	Restrictor Fitting	4		957-001-079	30' Hose Assy 3/8 x 260"	2
5	956-005-001	Fitting-Elbow 90°	2	10	957-004-080	40' Hose Assy 3/8 x 284"	1
6	956-007-003	Fitting-Tee	1		957-004-080	30' Hose Assy 3/8 x 284"	1
7	956-003-001	Fitting STR. APT. 3/4 ORB x 9/16 MJIC	1	11	957-004-014	40' Hose Assy 3/8 x 318"	2
					957-004-014	30' Hose Assy 3/8 x 318"	2

JM-22-0000382

OPTIONAL HYDRAULICS
FILL AUGERS

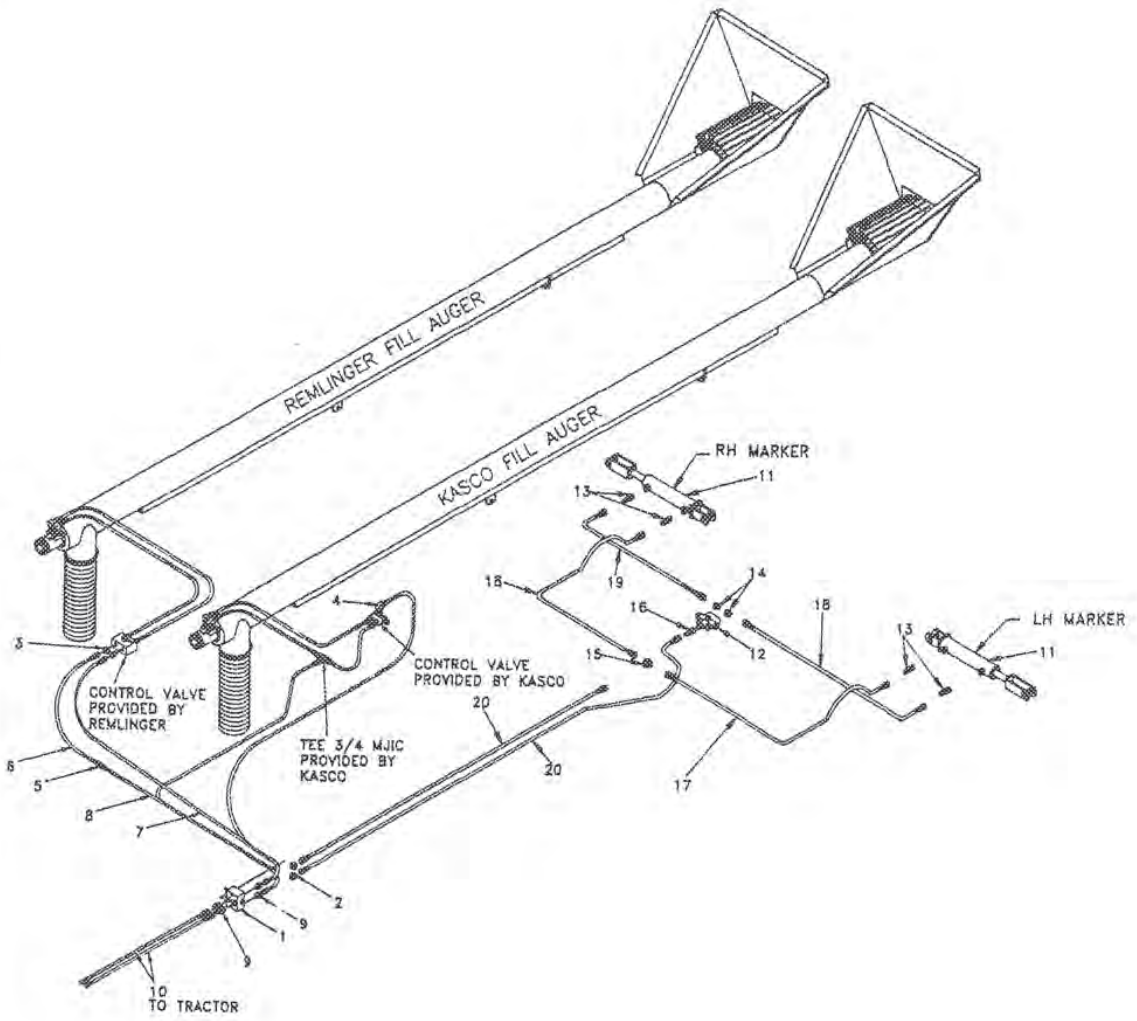


HINIKER P/N 80305509 DWG. NO. 3778

REF. NO.	PART NUMBER	DESCRIPTION	QTY.	REF. NO.	PART NUMBER	DESCRIPTION	QTY.
1	80305516	HYD Valve	1	5	209-01019	Union 3/4 MJIC (2)	1
2	203-35510	O-Ring Pipe Plug	2	6	957-005-021	Hose Assy 3/8 x 50"	1
3	956-003-003	Fitting-Straight Adapter 1/2 MNPT x 9/16 MJIC	2	7	957-001-074	Hose Assy 3/8 x 240"	1
				8	957-005-003	Hose Assy 3/8 x 191"	1
4	956-005-003	Fitting-Elbow 90° 1/2 MNPT x 9/16 MJIC	1	9	956-003-001	STR-ADPT 9/16 MJIC x 3/4 MORB	2

JM-22-0000383

OPTIONAL HYDRAULICS
MARKERS & FILL AUGERS

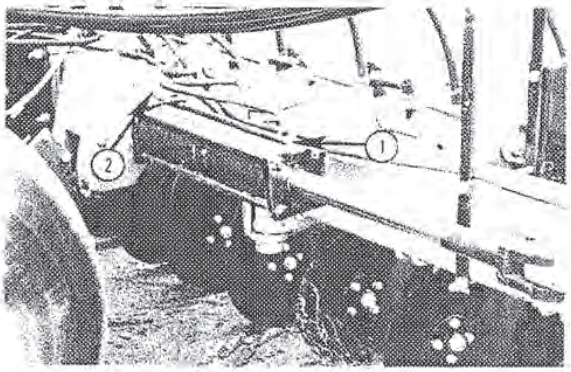


HINIKER P/N 80305509, 80305585 & 80305586 DWG. NO. 3779

REF. NO.	PART NUMBER	DESCRIPTION	QTY.	REF. NO.	PART NUMBER	DESCRIPTION	QTY.
1	80305516	HYD Valve	1	12	805-003-026	Sequence Valve	1
2	203-35510	O-Ring Pipe Plug	2	13	956-008-024	Restrictor Fitting	4
3	956-003-003	Fitting-Straight Adapter 1/2 MNPT x 9/16 MJIC	2	14	956-005-001	Fitting-Elbow 90°	2
				15	956-007-003	Fitting-Tee	1
4	956-005-003	Fitting-Elbow 90° 1/2 MNPT x 9/16 MJIC	1	16	956-003-001	Fitting STR. APT. 3/4 ORB x 9/16 MJIC	1
5	209-01019	Union 3/4 MJIC (2)	1	17	957-001-074	40' Hose Assy 3/8 x 240"	1
6	957-005-021	Hose Assy 3/8 x 50"	1		957-001-074	30' Hose Assy 3/8 x 240"	1
7	957-001-074	Hose Assy 3/8 x 240"	1	18	957-001-079	40' Hose Assy 3/8 x 260"	2
8	957-005-003	Hose Assy 3/8 x 191"	1		957-001-079	30' Hose Assy 3/8 x 260"	2
9	956-003-001	STR-ADPT 9/16 MJIC x 3/4 MORB	4	19	957-004-080	40' Hose Assy 3/8 x 284"	1
10	957-004-014	Hose Assy 3/8 x 318"	2		957-004-080	30' Hose Assy 3/8 x 284"	1
11	624129	2 1/2 x 24 CYL Assy PMC #AR-265	2	20	957-004-014	40' Hose Assy 3/8 x 318"	2
			1		957-004-014	30' Hose Assy 3/8 x 318"	2

JM-22-0000384

STEP 14A



LH SHOWN PHOTO NO. 3935A

Install right and left hand toolbar fold cylinder as shown in photo. **NOTE:** Restrictor fittings (arrow 1 and 2).

STEP 14B

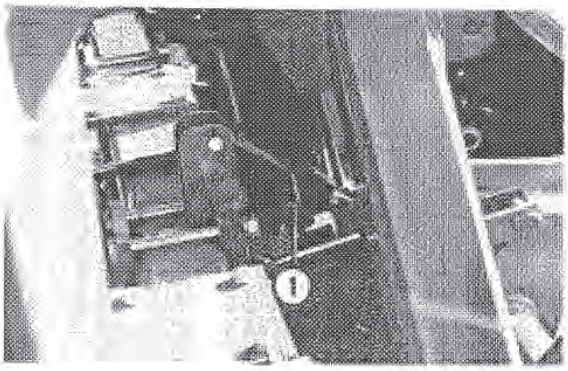


PHOTO NO. 4055

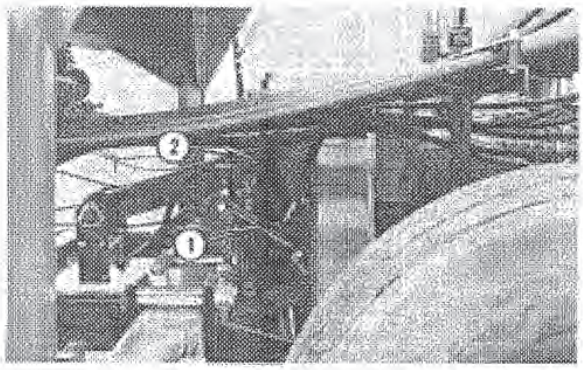
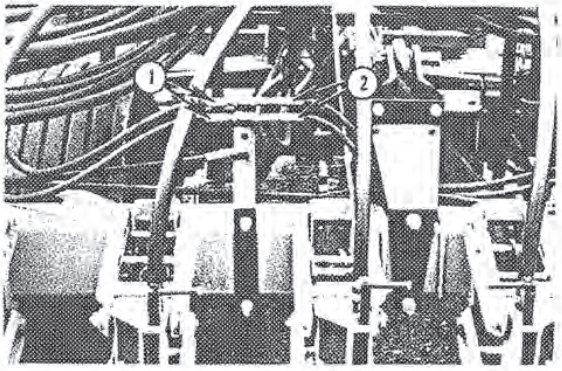


PHOTO NO. 3969

Install hydraulic hoses and fittings to transport lock cylinder (arrow 1) as shown in photo. Install hydraulic hose and fitting to center rockshaft lift cylinder (arrow 2).

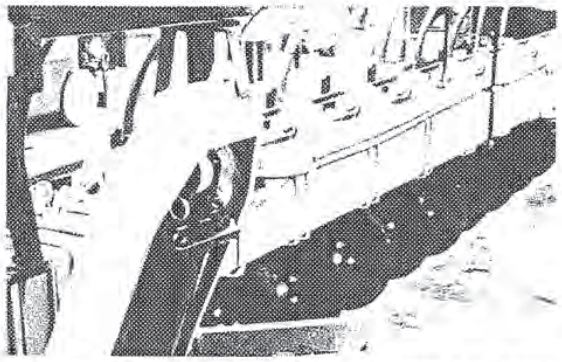
STEP 14C



TOOLBAR FOLD PLUMBING PHOTO NO. 3966A

Install (2) bulkhead tee fittings (arrow 1) into bulkhead plate. Add (2) inline tee (arrow 2) which runs to transport lock cylinder. **NOTE:** 90° bulkhead fitting is return line from left hand wheel lift cylinder.

STEP 14D



RH SHOWN PHOTO NO. 3958A

Install hydraulic hoses and fittings to right and left hand wheel lift cylinder. Route hoses through hose support (arrow 1) in photo 4059. **NOTE:** After 4800 seeder units have been installed, hydraulic hose must be tied up as shown in photo 3958A.

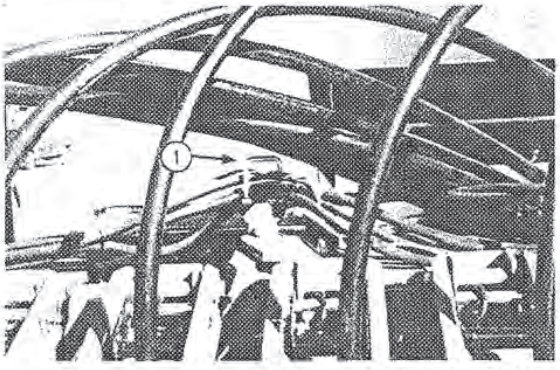


PHOTO NO. 4059

JM-22-0000385

STEP 14E

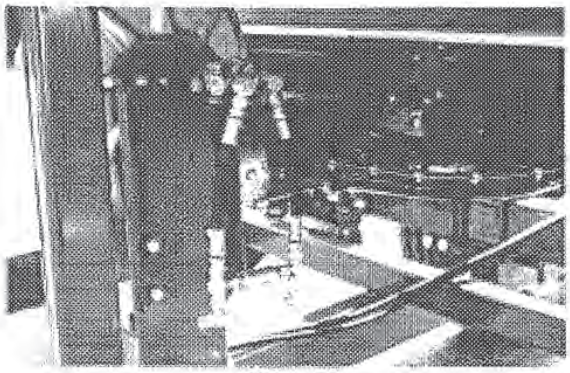
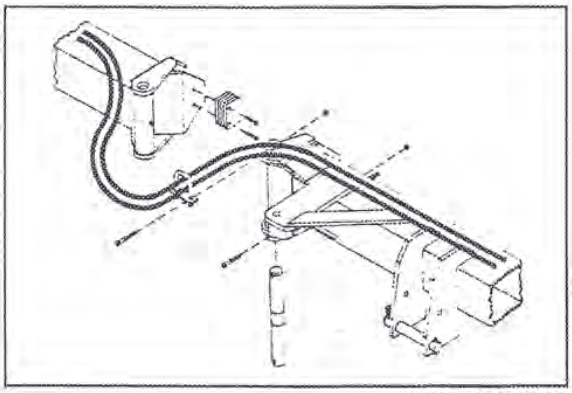


PHOTO NO. 4055A

Install hydraulic hoses to blower plumbing as shown in photo.

STEP 14F



DWG. NO. 3632

Install hydraulic hoses through pivot pin hose guide as shown in drawing.

NOTE: Optional marker hoses will also run through hose guide.

STEP 15

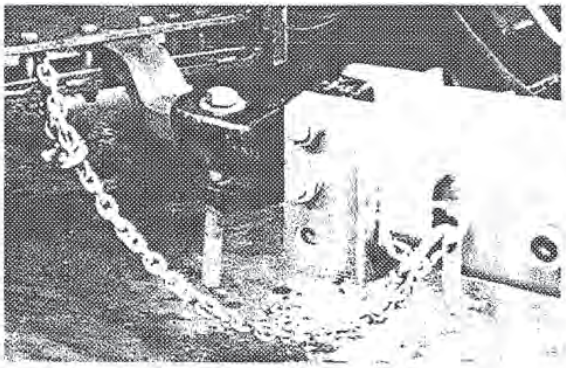


PHOTO NO. 3973

Attach 4836 tank/trailer to tractor hitch, and attach safety chain as shown in photo. Connect all hydraulic lines to tractor outlets.

STEP 16

IMPORTANT: Before operating hydraulic toolbar lift cylinders, all captive air must be removed from system. This may be done by removing cylinder pin from rod end of cylinder and cycling system until system is purged of air. Reattach cylinder rod pin and cautiously cycle toolbar lift through full cycle. Failure to take precaution may result in bodily injury or equipment damage.

Raise toolbar and remove stands from under toolbar. Raise toolbar to highest position.

STEP 17

IMPORTANT: Never operate wing fold cylinders without (4) restrictor fittings part number 956-008-024 for 4 inch cylinder, one at each end of both cylinders. Failure to have restrictors in place may result in body injury or equipment damage.

Fold toolbar forward, only half way at this time. Return toolbar to straight inline and lower toolbar to have bottom of toolbar 19 inches off the ground.

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STEP 18

CAUTION: A lifting device such as crane, loader, or forklift is required for handling large parts and shipping bundles. Do not attempt to remove disc opener units from shipping bundle while in vertical position. Bundle may fall, causing severe injury or death, if not handled with proper equipment. While removing bundling straps, wires, or brackets be certain to keep clear of any parts that may drop. Support heavy sections with hoist or blocks before removing wires or straps.

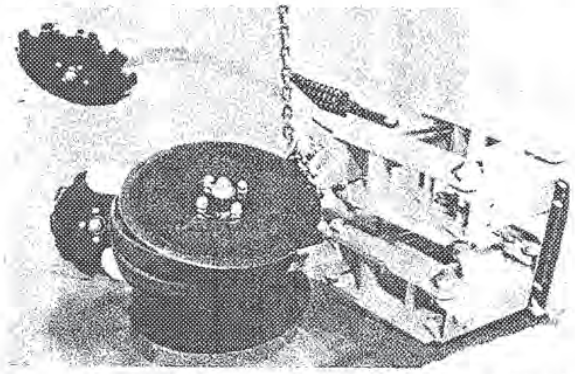


PHOTO NO. 3974A

When moving right and left hand disc opener shipping bundle, attach lift chain around rear mast shank, and between parallel link and gauge wheel, as shown in photo.

CAUTION: When removing any bundling straps, wires or brackets, be certain to keep clear of any parts which may drop. Support heavy sections with hoist or blocks before removing wires or straps.

STEP 19

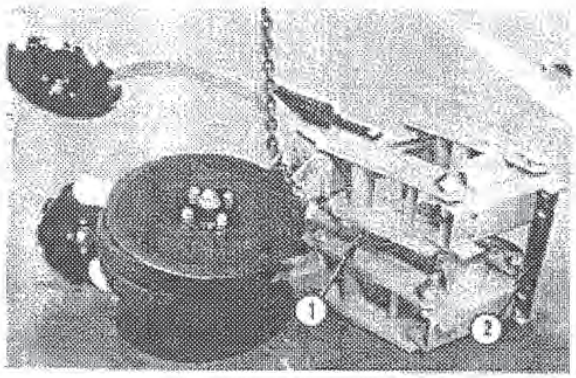


PHOTO NO. 3974

With disc opener shipping bundle laying securely on the floor as shown in photo, cut the shipping band (arrow 1) and unbolt angle strap (arrow 2). Lift top unit off and lay securely on the floor.

STEP 20

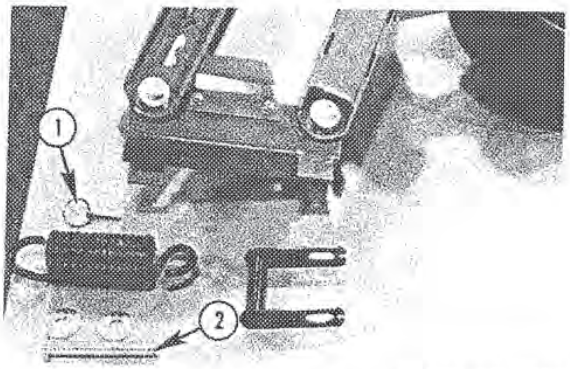
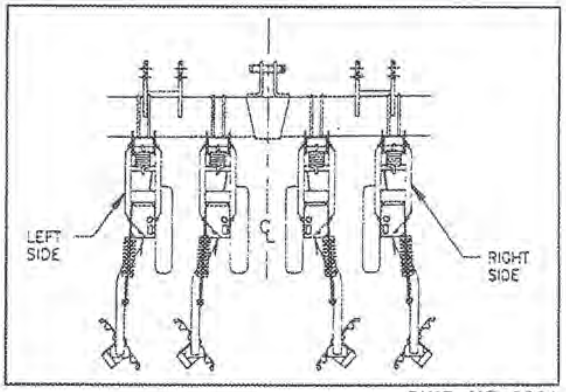


PHOTO NO. 3976

With disc opener laying on the floor, remove down pressure spring assembly. First remove klik pin (arrow 1) and 3/4" flat washer, then 3/4" pin (arrow 2). At this time the spring will be loose inside of disc opener. Set spring and handle aside at this time. It will all be reassembled later.

NOTE: All hardware should be tightened only enough to insure safety during assembly. Torque hardware to specified values, as shown on torque chart on page 5, only after assembly has been completed.

RIGHT AND LEFT SIDE DISC OPENER IDENTIFICATION



DWG. NO. 3634

Notice gauge wheel on inside, starting at toolbar center and the rotary closer support arm offset to outside.

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STEP 21

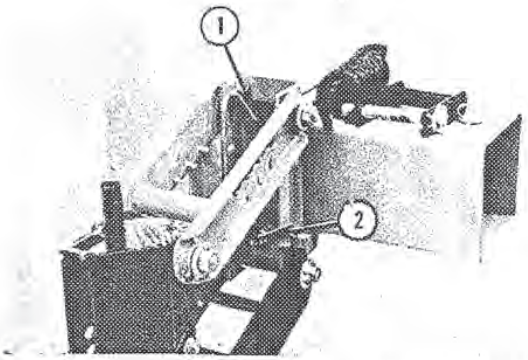


PHOTO NO. 3621A

Make sure bottom of toolbar is 19" off the ground before mounting disc opener up to the toolbar. See assembly diagrams on pages 21 to 23 for proper location of disc opener. Move disc opener up to toolbar with front mast locks engaged. Install (2) 1/2 u-bolts (arrow 1) with (4) 1/2 lockwashers and (4) 1/2 hex nuts (arrow 2).

STEP 22

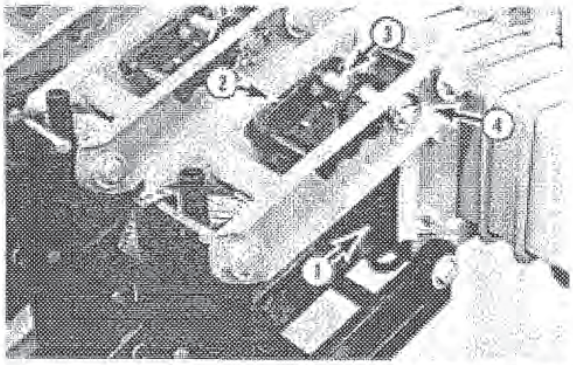


PHOTO NO. 3605A

After disc opener has been mounted up to toolbar and u-bolt and hex nuts are tight, reinstall down pressure spring (arrow 1).

NOTE: The large 1 inch hook opening is at bottom. use front 7/8 diameter rod anchor.

Reinstall adjusting handle (arrow 2) and 3/4" pin (arrow 3) with 3/4" flat washers and klik pin (arrow 4).

STEP 23

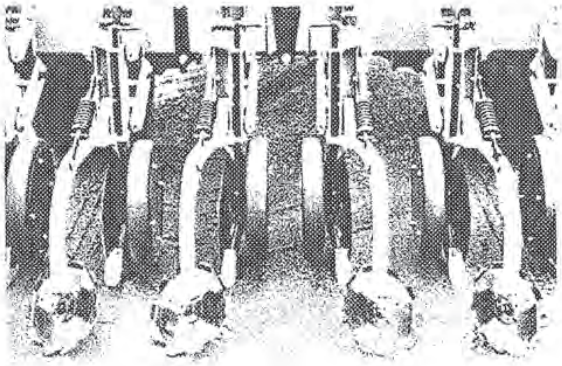


PHOTO NO. 3977

Continue to mount disc openers across the toolbar working from center out.

See Assembly Diagrams on pages 21 to 23 for proper location of disc openers.

STEP 24

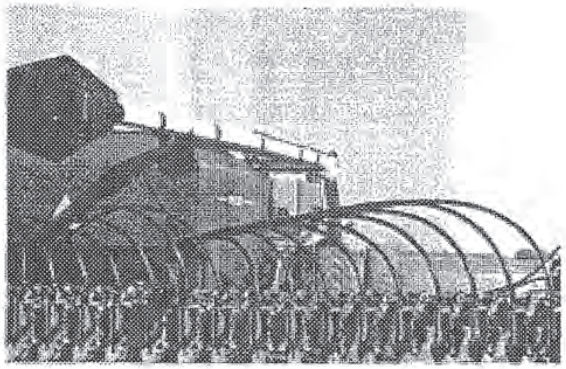


PHOTO NO. 3978

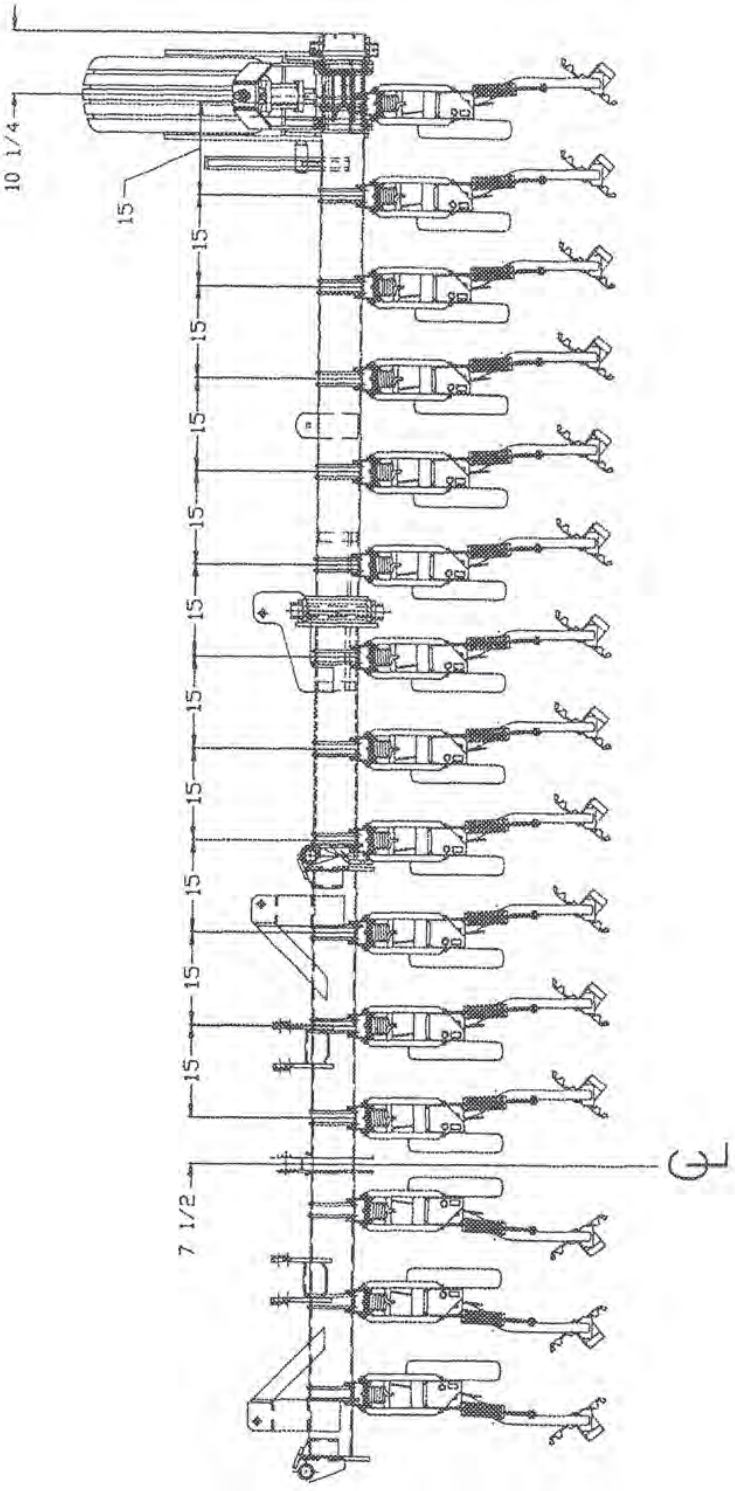
Continue to mount disc opener around hinges.

NOTE: On Model 4833 40 ft. w/15" spacing only. You must remove the bottom lock pad on the front channel weld of the row unit next to the horizontal wing hinge.

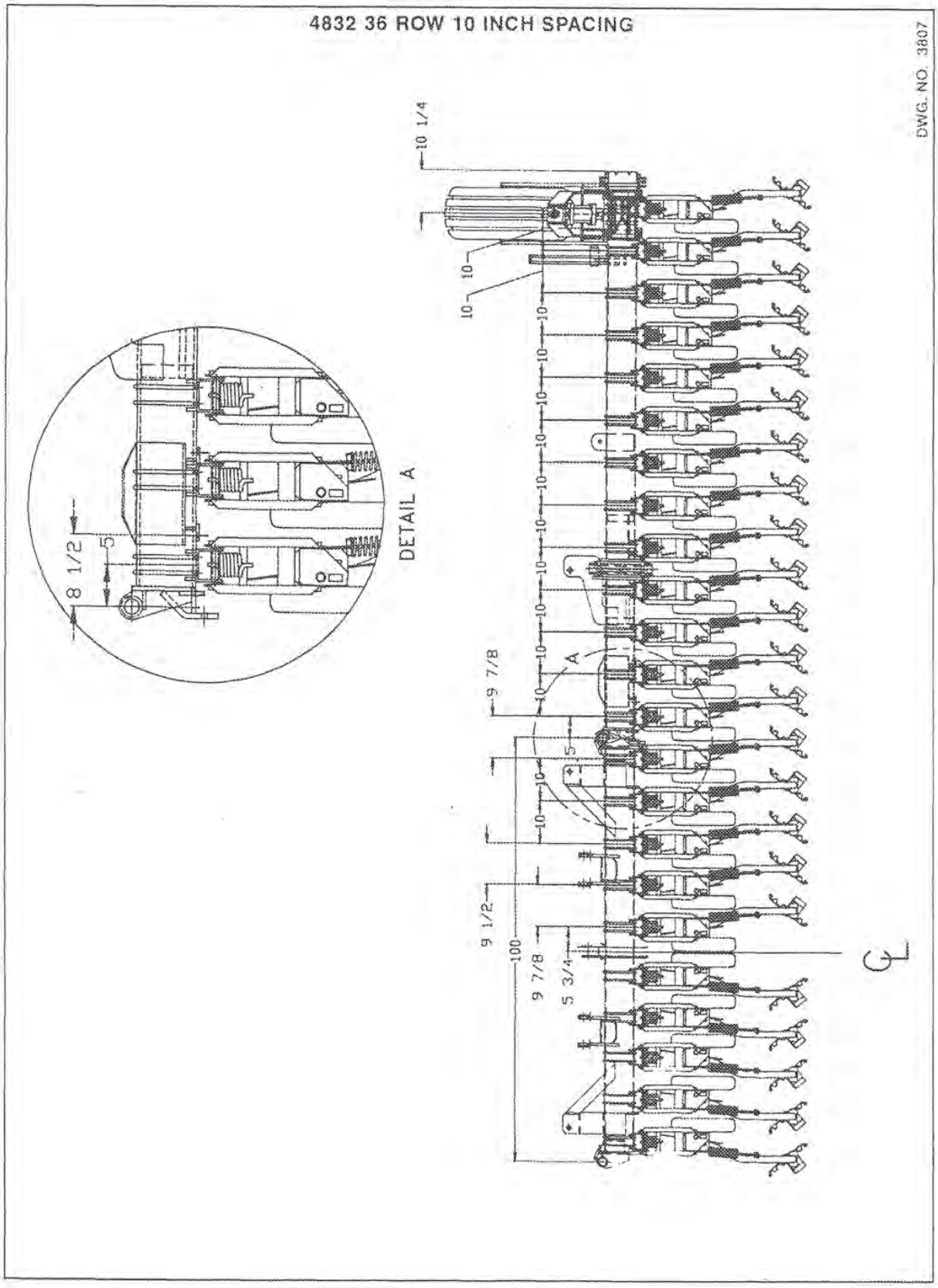
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4831 24 ROW 15 INCH SPACING

DWG. NO. 3806



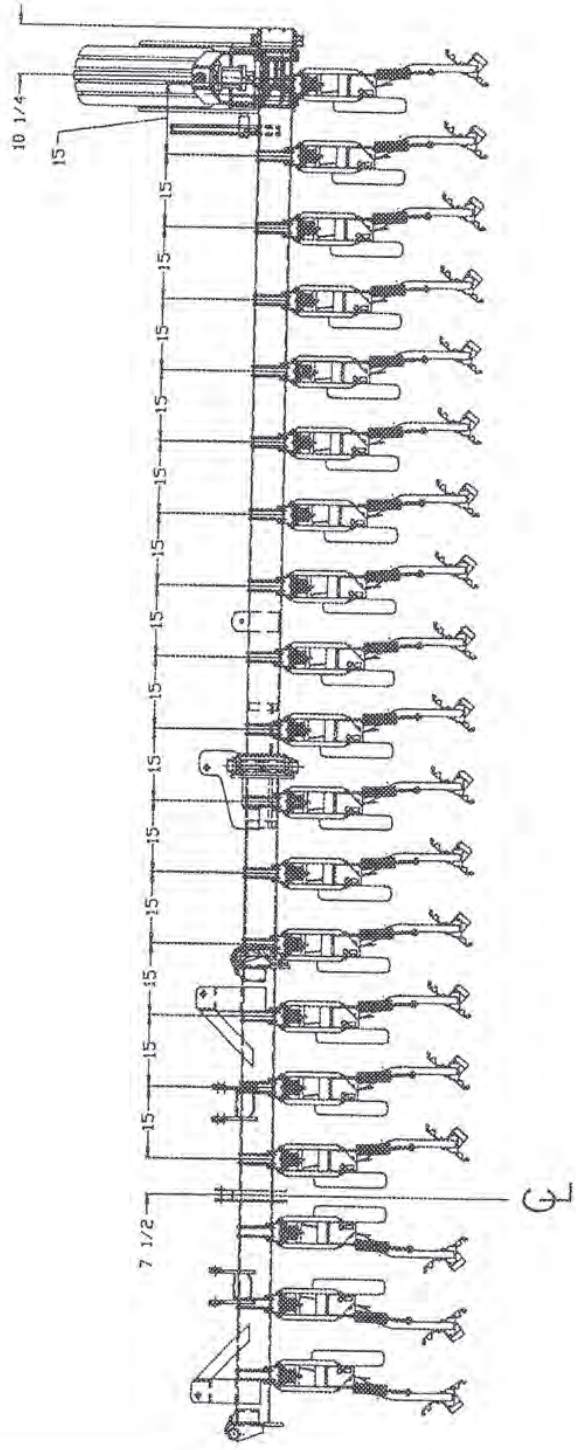
JM-22-0000389



JM-22-0000390

4833 36 ROW 15 INCH SPACING

DWG. NO. 3808



JM-22-0000391

STEP 25

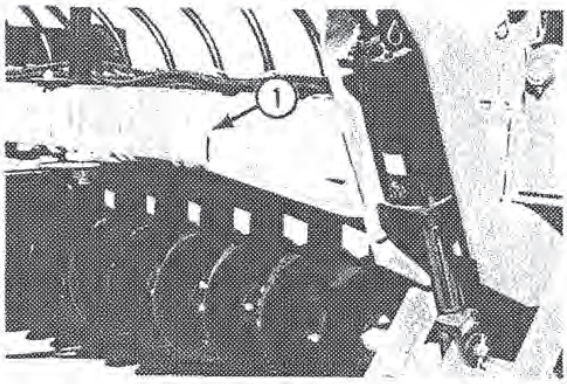


PHOTO NO. 4043

Raise toolbar up to full height, all five sections will be level at this time. Fold toolbar wings forward until toolbar guide (arrow 1) nose piece will enter wing rest plate.

STEP 26

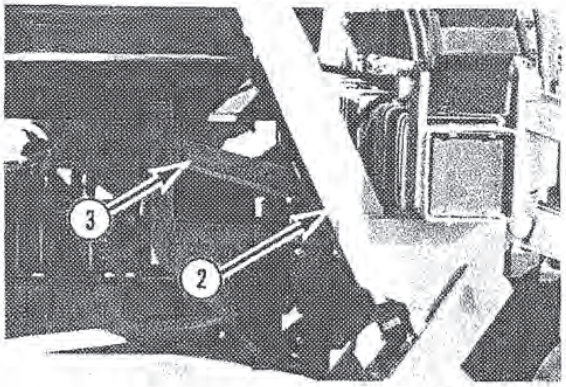


PHOTO NO. 4044

Fold toolbar wing all the way forward until toolbar guide (arrow 1) hits toolbar rest back stop (arrow 2). **NOTE:** Check that both sides are up to back stop before raising wheel lift arms and locking for transport.

IMPORTANT: When toolbar lowers onto toolbar rest, it will move rearward 2 to 3 inches. Failure to take precaution may result in bodily injury or equipment damage.

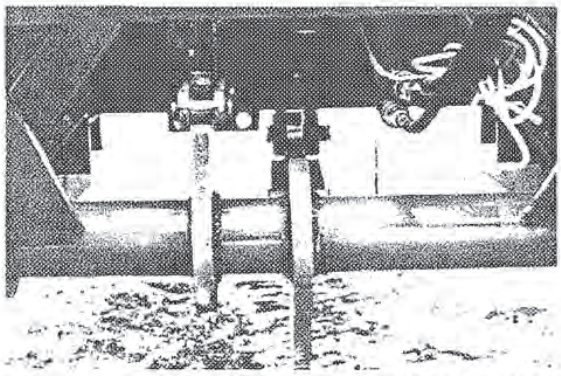


PHOTO NO. J102

NOTE: Make sure the transport lock arm clear the large cam and settles in the recessed groove before transporting. If it does not, adjust the center eye bolt on rockshaft lift cylinders.

STEP 27

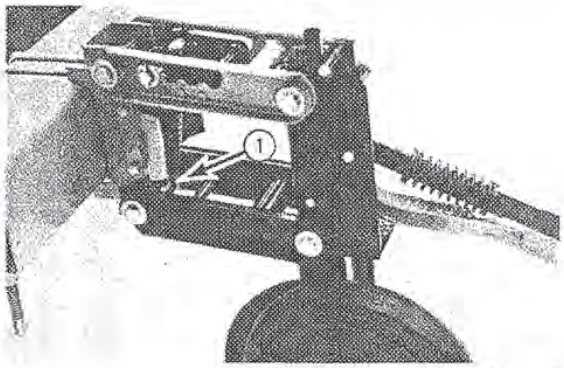


PHOTO NO. 3627

To insure uniform down pressure on all disc openers, check that the down pressure spring bottom hook is anchored on front 7/8 diameter tube. **NOTE:** This should be a start position for all units.

STEP 28

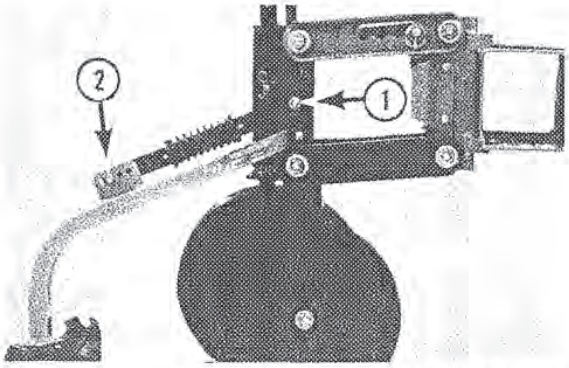


PHOTO NO. 3628

Check for uniform rotary closer down pressure strap anchor location front and rear. If required

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move front into middle hole on rear mast (arrow 1, previous page). Move rear anchor into third hole (arrow 2) as shown in photo 3626.

NOTE: This should be a start position for all units.

STEP 29

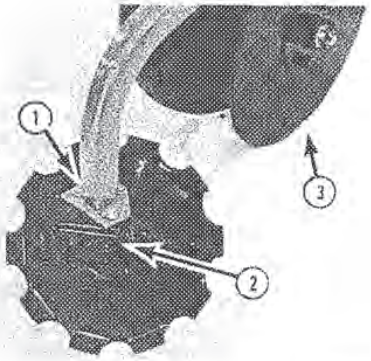


PHOTO NO. 3628

To insure uniform angle on all rotary closers, check that all units are flush at front edge (arrow 1) and the rotary closer bearing (arrow 2) is on the same side as the disc opener coulter (arrow 3).

NOTE: This should be a starting angle for all units.

STEP 30

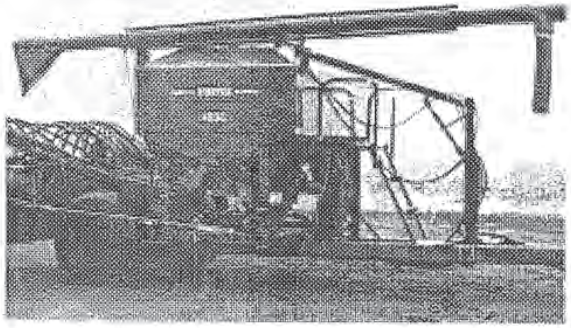


PHOTO NO. 3981

Install seed tube run from seed tank outlet to disc opener. See assembly diagrams on page 26 to 28 for proper length and position of hose running through hose guides.

STEP 31

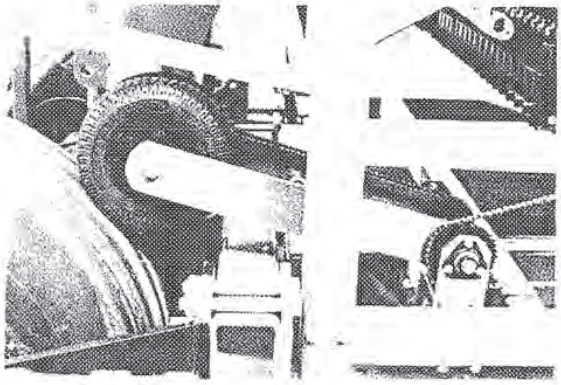
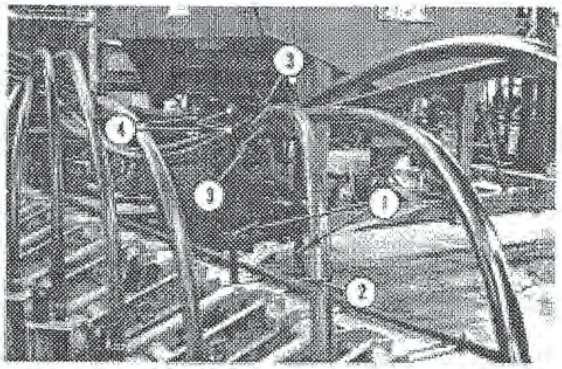


PHOTO NO. 4071

Install seed tubes through front hose rest.

NOTE: Seed tubes must run on top of shield over drive wheel.

STEP 32
40 FOOT TOOLBAR ONLY

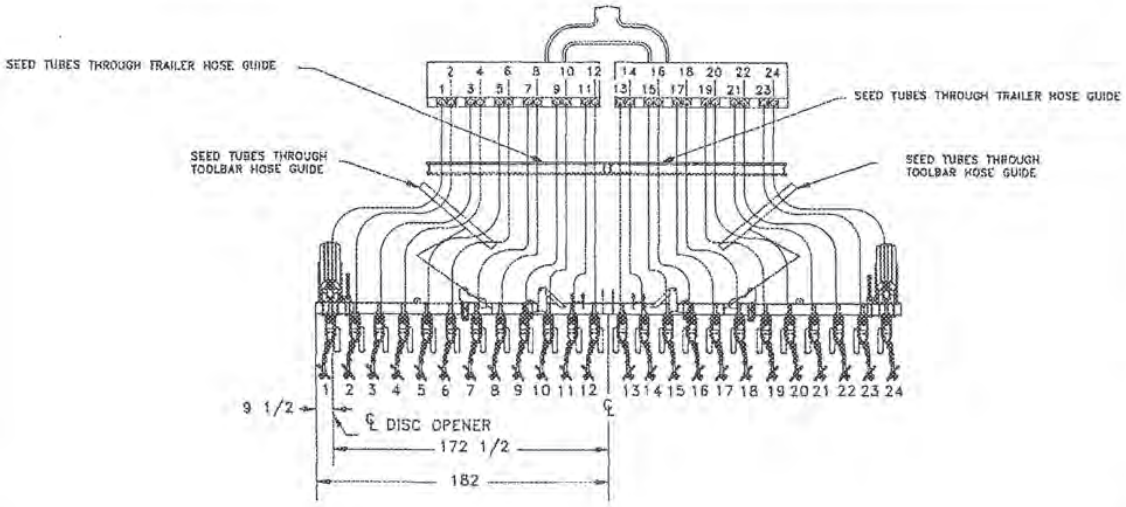


RH Shown PHOTO NO. 3983

Install (2) outer wing seed tube support straps (arrow 1) using (2) 1/2 x 8 1/2" hex bolt (arrow 2) with lockwasher and hex nuts. Install (2) cross straps (arrow 3) using (4) 3/8 x 1 1/2" hex bolt (arrow 4) with lockwasher and hex nuts.

NOTE: Number of seed tubes in support stand depends on number of outer toolbar disc openers.

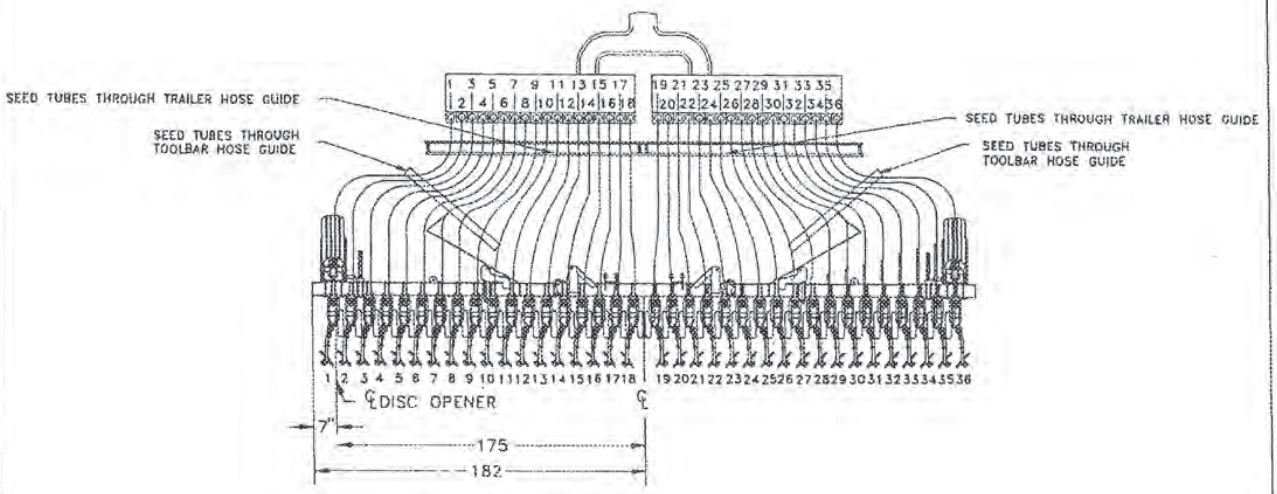
4831 30 FOOT 24 ROW 15 INCH SPACING							
SERIES 4800 AIR SEEDER	220 INCHES	206 INCHES	191 INCHES	180 INCHES	165 INCHES	154 INCHES	
HOSE NUMBER	1 & 24	2 & 23	3 & 22	4 & 21	5 & 20	6 & 19	
4831 30 FOOT 24 ROW 15 INCH SPACING							TOTAL HOSE LENGTH REQ'D
SERIES 4800 AIR SEEDER	146 INCHES	139 INCHES	129 INCHES	127 INCHES	122 INCHES	127 INCHES	320 FEET
HOSE NUMBER	7 & 18	8 & 17	9 & 16	10 & 15	11 & 14	10 & 15	



DWG. NO. 3 755

JM-22-0000394

4832 30 FOOT 36 ROW 10 INCH SPACING										
SERIES 4800 AIR SEEDER	222 INCHES	212 INCHES	203 INCHES	192 INCHES	183 INCHES	177 INCHES	166 INCHES	157 INCHES	151 INCHES	
HOSE NUMBER	1 & 36	2 & 35	3 & 34	4 & 33	5 & 32	6 & 31	7 & 30	8 & 29	9 & 28	
4832 30 FOOT 36 ROW 10 INCH SPACING										TOTAL HOSE LENGTH REQ'D
SERIES 4800 AIR SEEDER	141 INCHES	136 INCHES	136 INCHES	136 INCHES	131 INCHES	126 INCHES	124 INCHES	119 INCHES	119 INCHES	475 FEET
HOSE NUMBER	10 & 27	11 & 26	12 & 25	13 & 24	14 & 23	15 & 22	16 & 21	17 & 20	18 & 19	

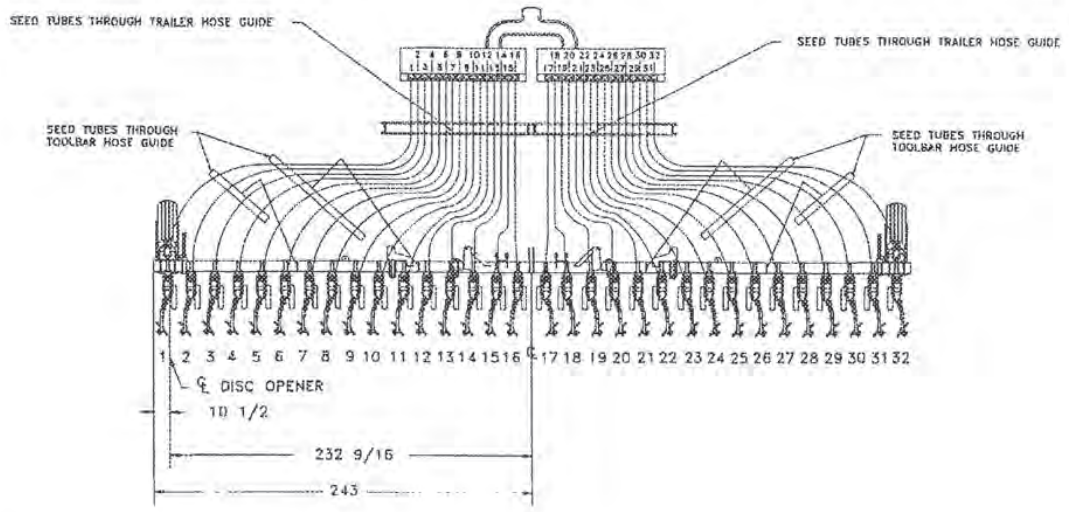


DWG. NO. 3754

JM-22-0000395

Assembly Diagrams 27

4833 40 FOOT 32 ROW 15 INCH SPACING									
SERIES 4800 AIR SEEDER	290 INCHES	285 INCHES	280 INCHES	235 INCHES	230 INCHES	206 INCHES	181 INCHES	180 INCHES	
HOSE NUMBER	1 & 32	2 & 31	3 & 30	4 & 29	5 & 28	6 & 27	7 & 26	8 & 25	
4833 40 FOOT 32 ROW 15 INCH SPACING									TOTAL HOSE LENGTH REQ'D
SERIES 4800 AIR SEEDER	164 INCHES	154 INCHES	148 INCHES	141 INCHES	138 INCHES	129 INCHES	127 INCHES	122 INCHES	492 FEET
HOSE NUMBER	9 & 24	10 & 23	11 & 22	12 & 21	13 & 20	14 & 19	15 & 18	16 & 17	



DWG NO. 3753

JM-22-0000396

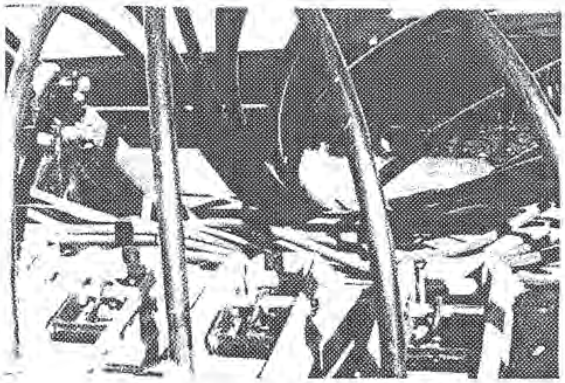


PHOTO NO. 4072

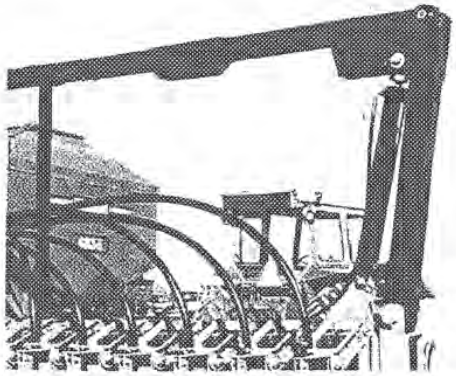


PHOTO NO. 4069

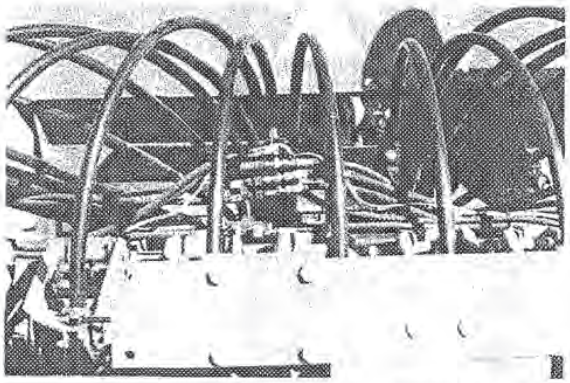


PHOTO NO. 4073

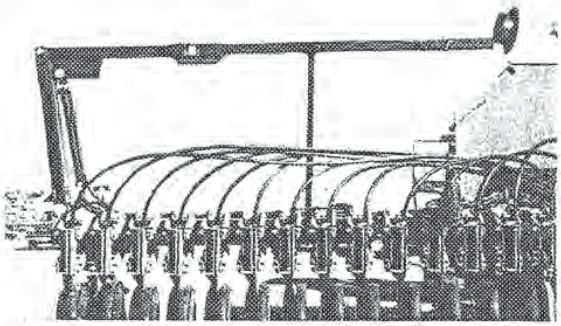


PHOTO NO. 4070

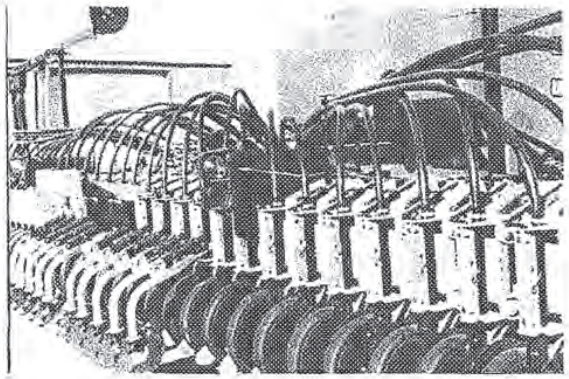
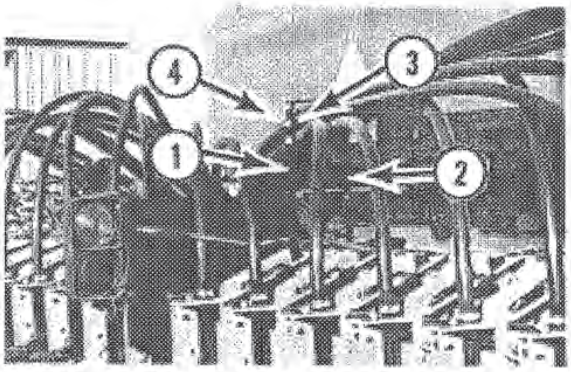


PHOTO NO. 4074

STEP 33
30 & 40 FOOT TOOLBAR

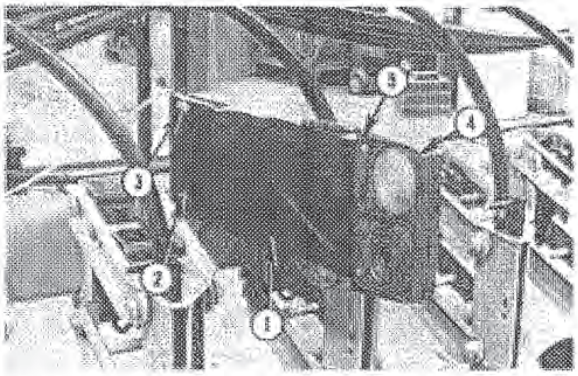


RH Shown PHOTO NO. 4060

Install (2) inner wing seed tube support and vertical strap (arrow 1) using (2) 1/2 x 8 1/2" hex bolt (arrow 2) with lockwasher and hex nut. Install cross straps (arrow 3) using (4) 3/8 x 1 1/2" hex bolt (arrow 4) with lockwasher and hex nuts.

NOTE: Number of seed tubes in support stand. 5 tubes in upper mount, 4 in lower for 30 foot 10 inch spacing.

STEP 34



RH Shown PHOTO NO. 3985

Install right and left hand light mount bracket (arrow 1) using (1) 1/2 x 8 1/2" hex bolt (arrow 2) and (1) 3/8 x 1 1/2" hex bolt (arrow 3) with lockwasher and hex nuts. Install light (arrow 4) using (4) 1/4 x 1 1/4" hex bolts (arrow 5) with 1/4" whiz nuts.

NOTE: Amber and red light will be visible from rear when toolbar is in transport.

STEP 35

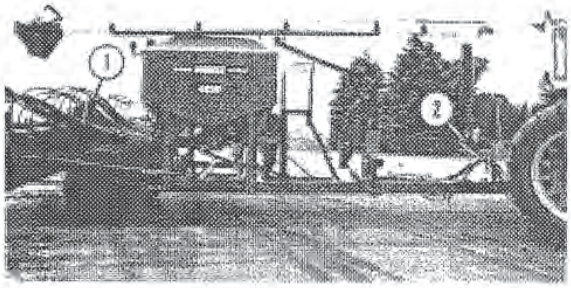


PHOTO NO. 3986

Continue to install all electrical wires using wiring diagram on page 32. Run rear light wire through rear pivot pin holder (arrow 1) and front 7-point plug wire through front loop (arrow 2).

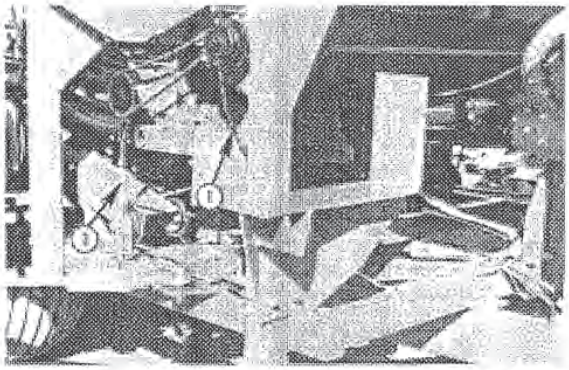


PHOTO NO. 3942B

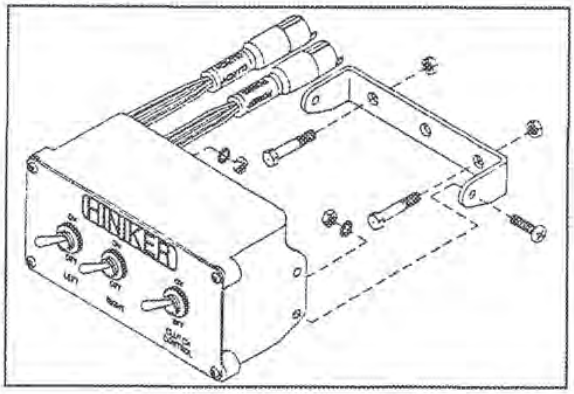
Continue to install dual electric clutch wiring (arrow 1) and blocked seed detector wiring (arrow 2). Use wiring diagram on page 32.

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CONSOLE INSTALLATION

CONSOLE INSTALLATION

Select an easily accessible area to mount the console in the tractor cab. Mount the bracket to the cab using the 1/4-20 bolts and nuts. Mount the console to the bracket using the #8-32 bolts and nuts.



DWG. NO. 3638

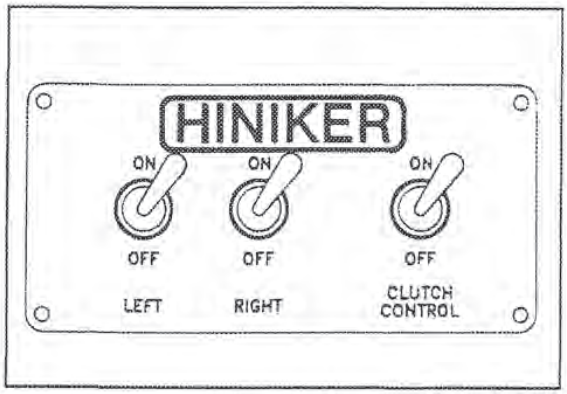
Attaching the lead with the circuit breaker to the positve battery terminal and the remaining lead to the negative terminal.

Route the 10 foot clutch cable from the clutch switch box to the hitch area of the tractor. Connect the 20 foot clutch cable to the 10 foot cable and route along the left tongue to the Seeder bin support. Connect the clutch "y" cable to the 20 foot cable and route to the clutches. The 2 pin connector with the Green and Black wires connects to the clutch on the right side and the 2 pin connector with the Red and Black wires connects to the clutch on the left side. Secure all wiring to the top of frame members to prevent possible damage by pinching or chafing.

NOTE: Allow room at the hitch for proper turning.

CLUTCH OPERATION

The Clutch Control Box has three switches. The two left most switches, labeled Left and Right, will determine which clutches will operate when the Clutch Control Switch is activated. The Clutch Control Switch, located on the right, is the master clutch control. This allows the ability to turn on either or both clutches with one switch.



DWG. NO. 3639

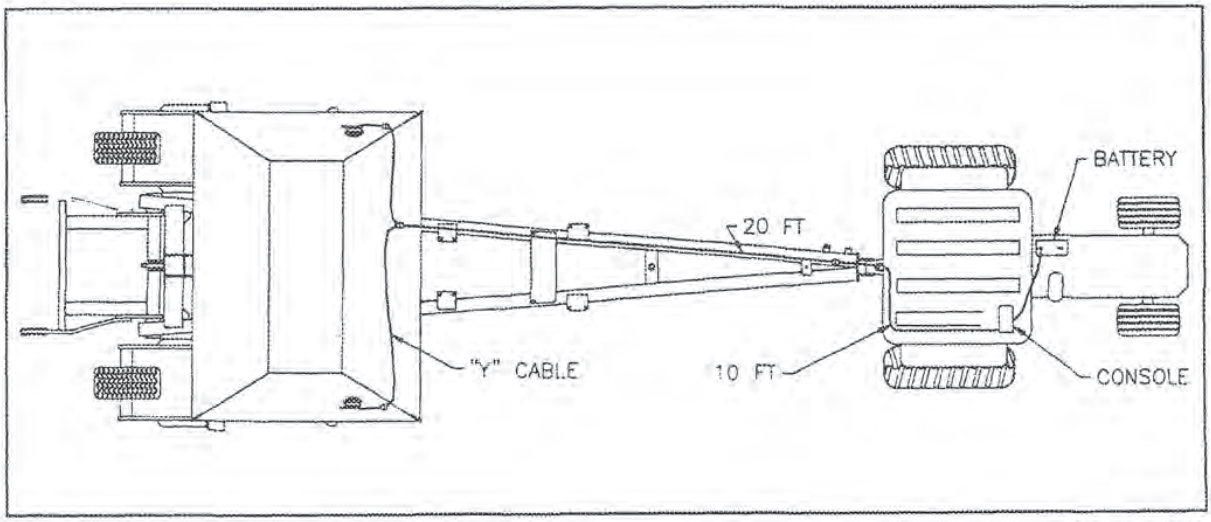
Once the electric clutch is turned on, and the electric clutches engage activating the seed metering mechanism, a time delay will occur before the metered seed reaches the disc opener unit.

NOTE: Because the 4800 seeder has a ground wheel drive arrangement, the seeder must be in motion before the seed can be metered and delivered to the ground engaging seed boots.

Because of the previously mentioned start up time delay, "skips" could occur when stopping and starting the 4800 seeder in the field. To prevent these "skips" or unseeded areas, it may be necessary on headlands to turn seeder switch on approximately 10 feet before entering seeding point.

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NOTE: Lower seed rates will require a greater distance. To determine correct distance for your seed rate, place a start flag and travel forward. Watch for seed coming out of seed boots, stop and measure that distance.



DWG. NO. 3640

4800 OPERATIONAL PROCEDURES

DEALER LOT
(manual page number in parenthesis)

- Level frame parallel to ground. (See page 17 in Operators Manual.)
- Make sure 3rd arm parallel to lower arms. (See page 17 in Operators Manual.)
- Fold and unfold unit 6 or more times to purge air from hydraulic lines.
- Make sure wing guides against stop before lifting LA wheels for transport. (See page 15 in Operators Manual.)
- Make sure latch drops over cam into slot. (See page 15 in Operators Manual.)
- Set fan at 11 ounces. Increase only for high seed rates or very large seed size. (See page 27 in Operators Manual.)
- Remove expansion plugs in manifolds and blow out dust and debris. (See page 48 in Operators Manual.)

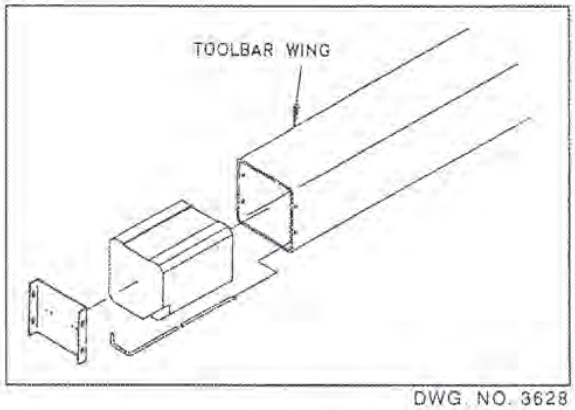
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ASSEMBLY-OPTIONAL EQUIPMENT

BALLAST WEIGHT

ORDER ITEM NUMBER	DESCRIPTION
810-001-176	Concrete block 22 lbs. each.

QUANTITY REQUIRED	
30 Foot Toolbar	22
40 Foot Toolbar	38



DWG. NO. 3628

To add additional weight to toolbar, concrete blocks can be ordered. Install concrete blocks as shown.

NOTE: Position of block pull rod and large corner notch to the inside.

WEIGHT BRACKET

ORDER ITEM NUMBER	DESCRIPTION
80305512	Weight Bracket Components

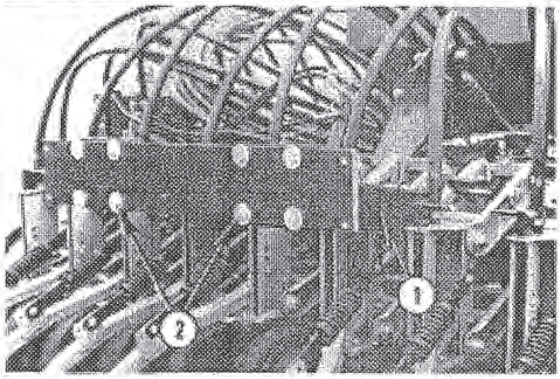


PHOTO. NO. 3988

Install tractor front suitcase weight mounting bracket (arrow 1), using (4) 5/8" u-bolts and (8) 5/8" lockwashers and (8) hex nuts (arrow 2).

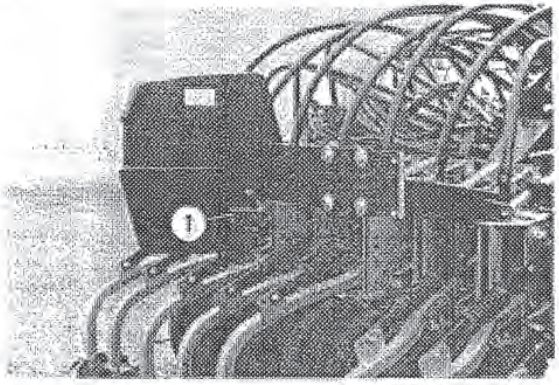


PHOTO NO. 3989

Case/IH suitcase weights fit this mounting. The clamping lock (arrow 1) fits on the bottom edge of mounting bracket.

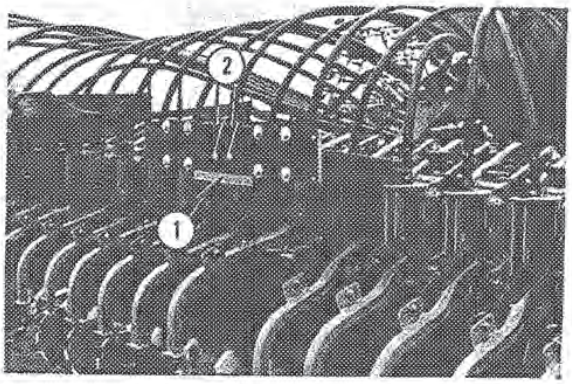


PHOTO NO. 3990

To fit JD suit case weights, lower support (arrow 1) must be installed using (2) 5/8 x 2" carriage bolts with (2) 5/8 lockwashers and (2) 5/8 hex nuts (arrow 2).

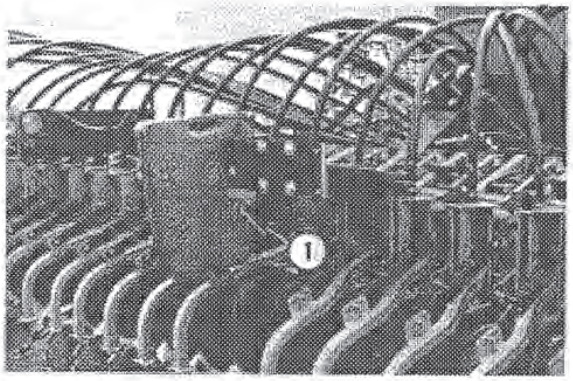
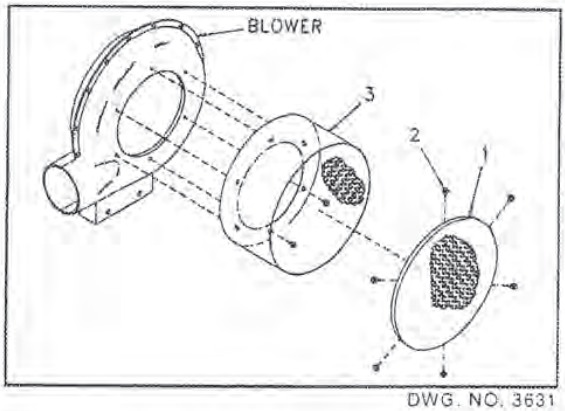


PHOTO NO. 3991

Shown in photo: JD suitcase weight attached to weight bracket assembly. Notice locking stud in the middle (arrow 1). A minimum of (2) suit case weights must be used. Secure with through bolts.

AIR BLOWER SCREEN

ORDER ITEM NUMBER	DESCRIPTION
80305510	Blower Screen Components



DWG. NO. 3631

To avoid clogging the air inlet screen of the air blower with possible debris, a cylindrical screen is offered as an option. The cylindrical screen has a larger surface area compared to the flat screen offered with the 4836 tank/trailer. The additional surface area still allows enough air to flow into the air blower even if debris begins to clog the screen.

The cylindrical screen is attached to the blower using the (6) 1/4" self tapping screws and washers that are currently used to attach the flat screen onto the blower. The screen cover is attached to the cylindrical screen with (6) 1/4" self tapping screws which are included with this option.

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FILL AUGER

ORDER ITEM NUMBER	DESCRIPTION
80305509	Fill Auger Components

A fill auger can be ordered as an option with the unit. You have a choice of either an auger made by Kasco Manufacturing or Remlinger Manufacturing. Included with the fill auger are the components needed for it's support. The fill auger support is attached to the trailer and allows the fill auger to rotate easily for use in the field or for transporting.

First, the front and rear support brackets must be attached to the tank. Two people will be needed for this operation. The front bracket (arrow 1) is attached at the front of the tank on the right side. The rear bracket (arrow 2) is attached at the rear of the tank, also on the right side. The brackets are attached by first removing the first (2) 5/16 whiz lock bolts (arrow 3) on the right side of the tank. One person will need to get inside the tank to hold the whiz lock nuts as the bolts are being removed.

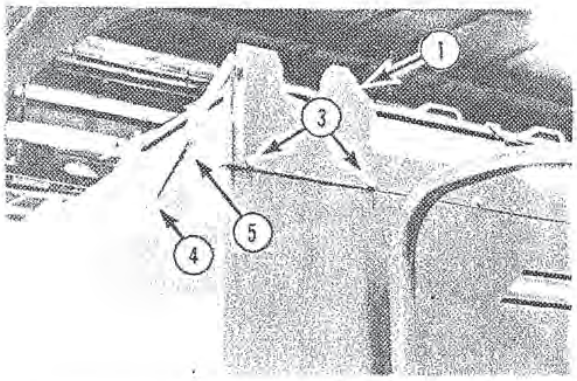


PHOTO NO. 4063

Remove the (4) 5/16 whiz bolts and discard. Drill out the four holes to 17/32 diameter. Line up the bottom holes of the front and rear support brackets. Insert the 1/2 by 1 1/2" long (Item 3) bolts through the 3 pieces and secure using 1/2 whiz locknuts.

Remove the second 5/16 whiz bolt (Item 4) from the front on the right side of the tank. Secure the front top (17 3/4") (Item 5) to the front auger support weld using a 3/8 by 1 1/4 bolt and whiz nut (Itme 23. 24).

Put (8) 3/8 flat washers (Item 21) between the front strap and front auger support weld. Secure the other end of the strap to the second hole in the right side of the tank using the 5/16 x 3/4 whiz bolt and whiz nut.

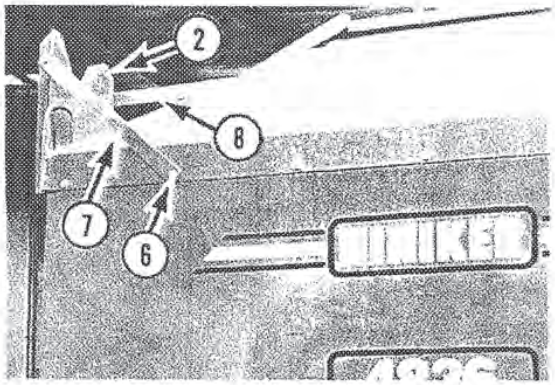


PHOTO NO. 4065

Remove the second 5/16 whiz bolt from the right rear side of the tank (Item 6). Attach the 20" long side strap (Item 7) to the tank using the bolt just removed. Fasten the strap to the rear auger support weld using a 3/8 x 3/4 bolt and whiz locknut.

Fasten the 17" long strap (Item 7) to the rear auger support using a 3/8 x 3/4 bolt and whiz nut.

Remove the 3/8 by 1 bolt and the (2) 3/8 locknuts used to attach the cover weld to the tank. Use a 3/8 by 1 1/2 full thread bolt to secure the rear strap (Item 8) to the lug on the rear hopper top half weld.

Put a two way locknut on the bolt as a spacer between the lug and the strap. Secure the strap using a 3/8 locknut. Make sure the strap is free to move.

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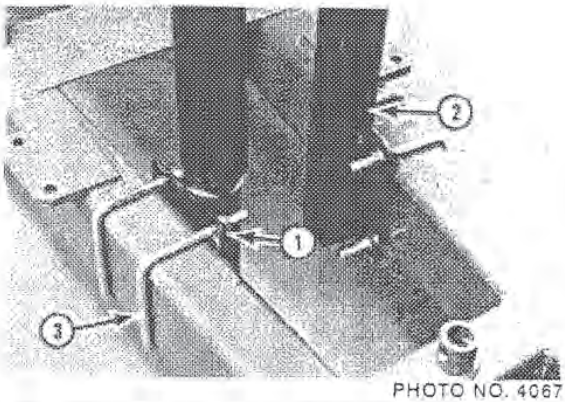


PHOTO NO. 4067

Attach the outer tube weld (arrow 1) to the right trailer tongue in front of the front mounting plate, using (2) of the 5/8" u-bolts provided.

Attach the lower support weld (arrow 2) to the left side of the trailer in front of the front mounting plate, using the other (2) 5/8" u-bolts. Make sure the upper braces of the lower support weld face toward the center of the trailer.

Set the spacer (arrow 3) on top of the outer tube weld.

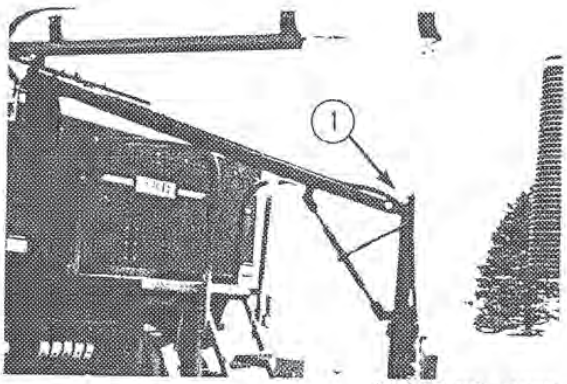
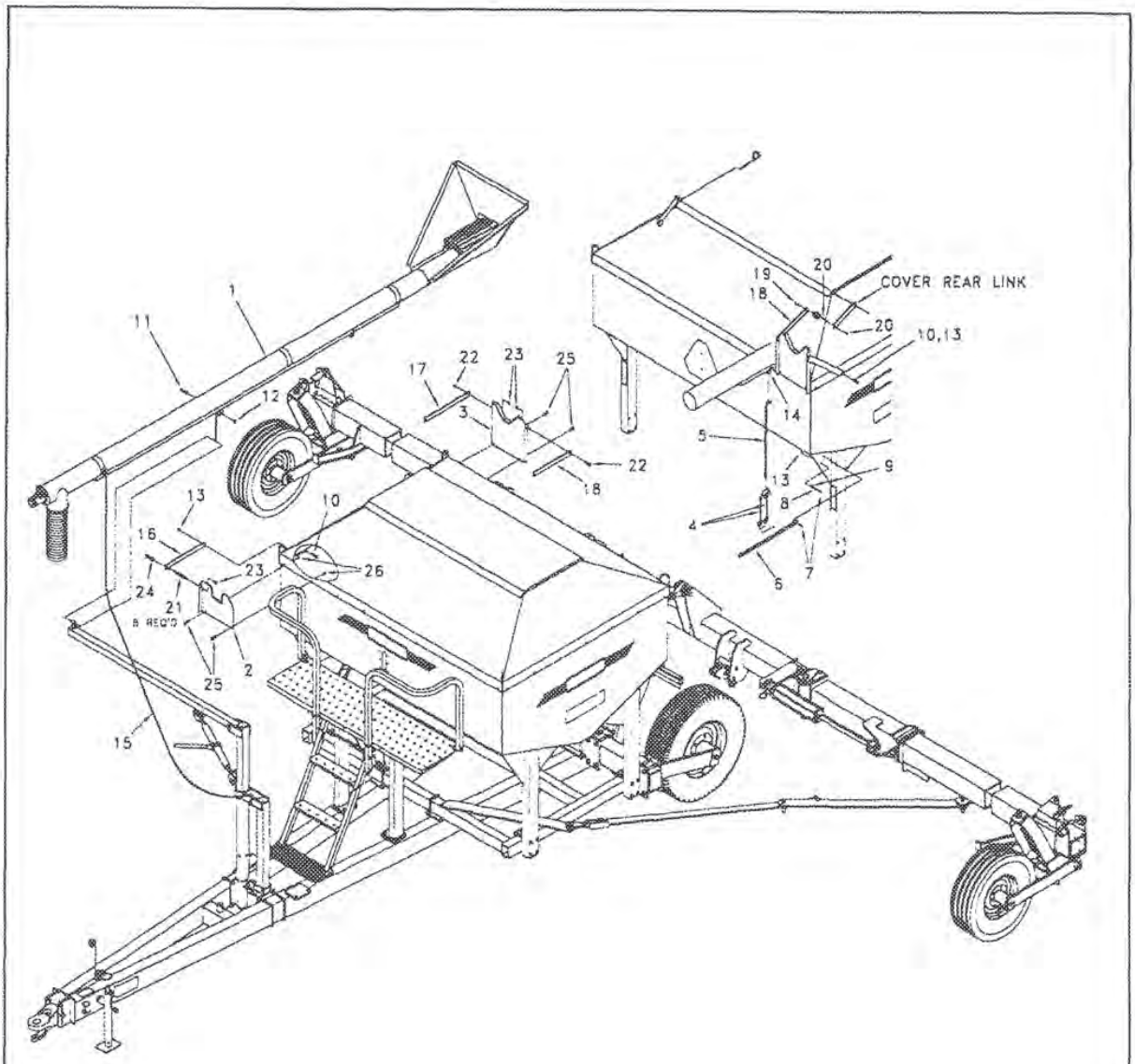


PHOTO NO. J1078

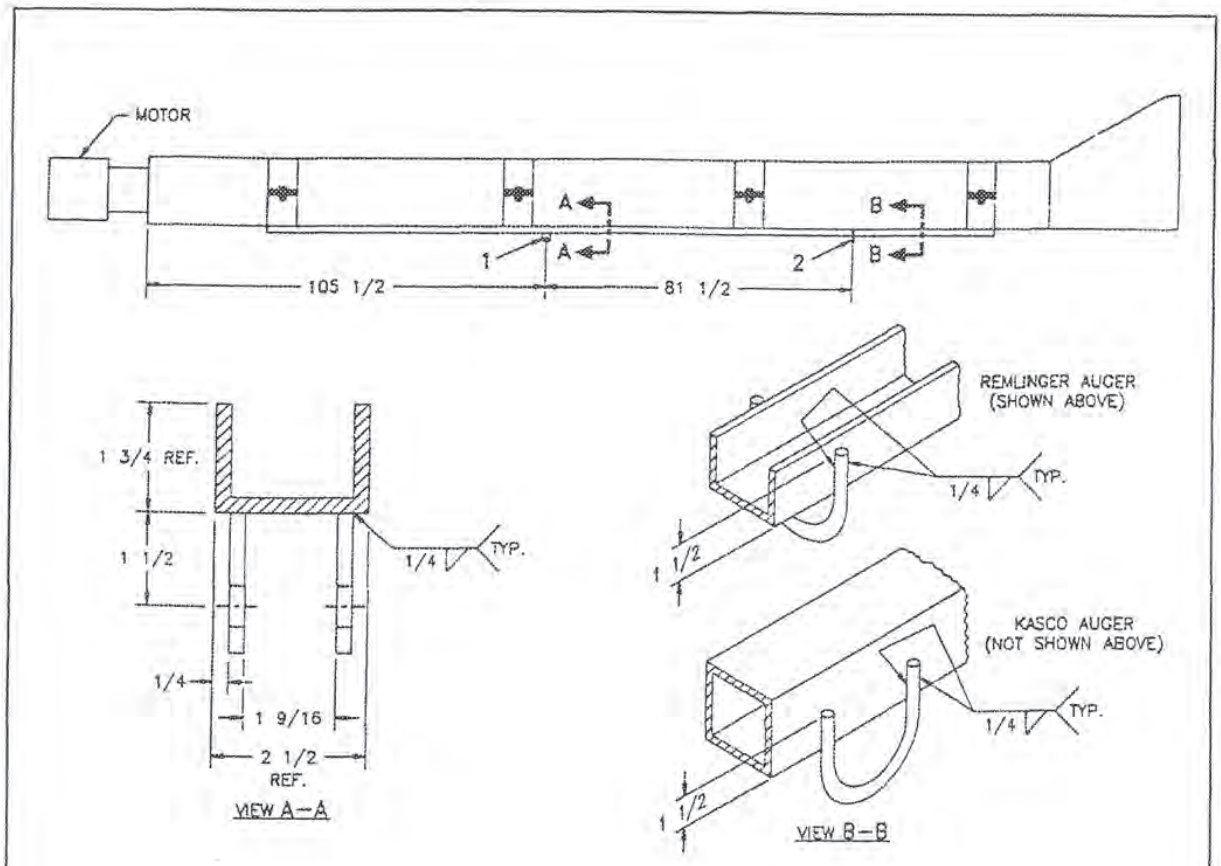
Insert the vertical tube weld (arrow 1) so the bottom of the weld goes through the outer collar of the lower support weld, the spacer and the outer tube weld. The collar of the vertical tube weld should line up inside the collar of the lower support weld. Some adjustment may be needed with the placement of the outer tube weld and lower support weld on the trailer to assure proper alignment for the vertical tube weld to be inserted.



DWG. NO. 3672A

REF. NO.	PART NUMBER	DESCRIPTION	QTY	REF. NO.	PART NUMBER	DESCRIPTION	QTY
1		Remlinger or Kasco		14	80305520	Horse Shoe Tab	1
2	80504730	Front Auger Support Weld	1	15	80305578	Rope	1
3	80504737	Rear Auger Support Weld	1	16	80504734	Front Strap 17 3/4 Long	1
4	622684	Tarp Strap	2	17	80504733	Side Strap 20" Long	1
5	80305530	Rod	1	18	80504732	Rear Strap 17" Long	1
6	80305531	Handle Lever	1	19	700-20099	HHCS 3/8-16 NC Full THF x 1 1/2	1
7	950-001-110	Hex Head Cap Screw 5/16-18 x 1 Gr. 5	2	20	951-005-051	Lock Nut 3/8-16 NC 2-Way	2
8	033-12007	5/16 Flat Washer SAE PL	1	21	952-002-003	3/8 Flat Washers	9
9	80305532	Spacer	1	22	950-001-089	HHCS 3/8-16 NC x 3/4	2
10	950-002--006	Bolt-HHFL WZLK 5/16-18 x 3/4	1	23	951-002-006	Whiz Nut 3/8-16 UNC	3
11	031-06308	HHCS 5/8-11 UNC x 2 3/4 Gr. 5	1	24	950-001-106	HHCS 3/8-16 UNC x 1 1/4 Lg Gr. 5	1
12	951-005-044	Lock Nut 2-Way 5/8-11	1	25	950-001-125	HHCS 1/2-13 NC x 1 1/2 Lg	4
13	951-002-002	Nut-FL WZLK 5/16-18	2	26	951-002-004	Whiz Nut 1/2-13 NC	4

JM-22-0000406



REF. NO.	PART NUMBER	DESCRIPTION	QTY	REF. NO.	PART NUMBER	DESCRIPTION	QTY
1	80305519	Support Tab	2	2	80305520	Horseshoe Tab	1

NOTE: If auger is not balanced properly, the auger clamps can be loosened, and the auger moved forward or backward, depending upon proper balance of the auger.

REMINGER AUGER

To prepare the Remlinger Auger for proper installation, a small amount of welding is needed. Two support tabs need to be welded to the channel, as shown in view A-A of the drawing above. A horseshoe tab also needs to be welded to the channel, as shown in the top drawing of view B-B. The horseshoe tab must be welded 81 1/2 inches from the support tabs. After installing the auger onto the support, if auger is not balanced properly, the clamps can be loosened and the auger moved until it is balanced.

KASCO AUGER

To prepare the Kasco Auger for proper installation, a small amount of welding is needed. Unlike, the Remlinger auger, the support tabs are already welded to the tubing provided with the auger. The horseshoe tab still needs to be welded 81 1/2 inches from the support tabs as shown in the bottom drawing of view B-B. After installing the auger onto the support, if auger is not balanced properly, the clamps can be loosened and the auger moved until it is balanced.

Once the vertical tube weld has been inserted properly, tighten the 5/8" u-bolts to torque and insert the 3/8" bolt and nut to the bottom of the vertical tube weld.

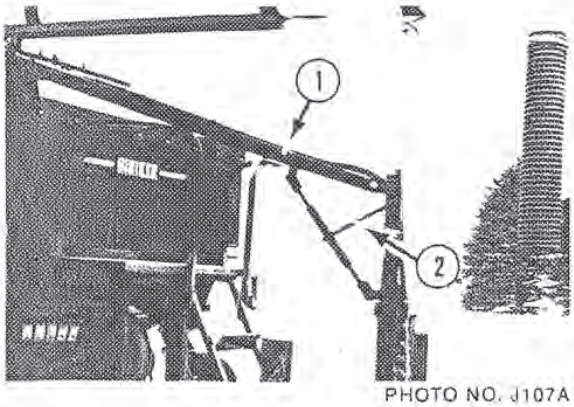


PHOTO NO. J107A

Attach the swing arm weld (arrow 1) to the vertical tube weld. Line up the holes on the square tubing of the swing arm with the holes on the swing arm supports of the vertical tube weld, and insert the 3/4" bolt and nut. The ratchet jack (arrow 2) can be attached to the ratchet jack supports on the swing arm and the vertical tube weld as shown in the picture above. Install 10' rope, to upper clamp as shown in photo J107A.

FILL AUGER
Installation of Rear Anchor Lever

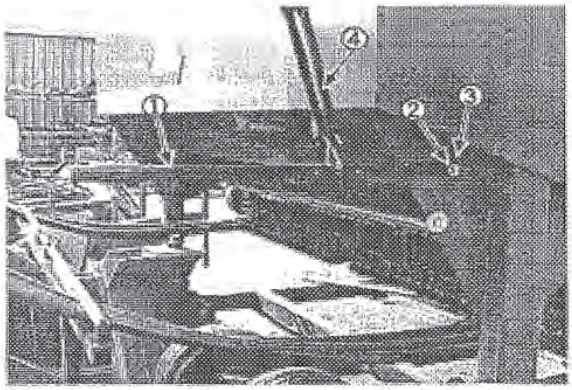


PHOTO NO. J106A

Install lever (Arrow 1), use end hole as shown in photo. Install (1) 5/16 x 1 1/4 inch long hex bolt (Arrow 2) using 5/16 flat washer with 5/16 hex lock nut on inside. This will be assembled loose so lever is free to pivot. Install (1) 5/16 x 1 1/4 inch long hex bolt (Arrow 3) using one large 1 1/4 OD washer and spacer with 5/16 hex lock nut on inside. Install two tarp straps (Arrow 4) as shown in photo.

4836 AIRSEEDER FILL AUGER POSITIONING

The Fill Auger is designed for one-man operation; however, two important instructions must be followed.

1. The auger must be balanced in the support assembly with slightly more weight on the hopper end.
2. A rope must be attached to the forward clamp on the support frame.

Follow the pictured sequential procedure below and the following page:

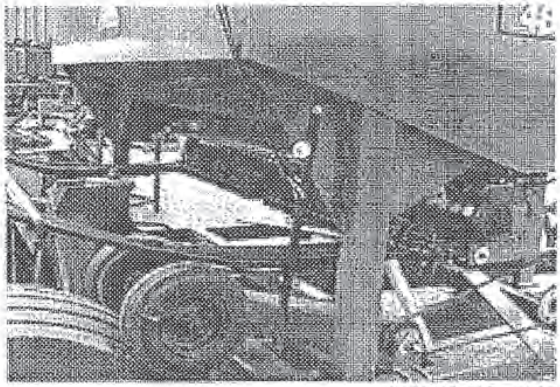


PHOTO NO. J105

1. Auger lever secured.

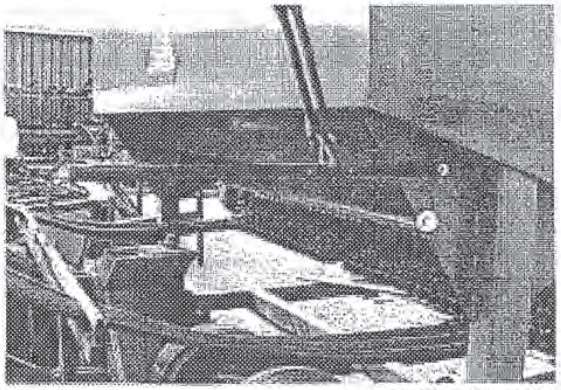


PHOTO NO. J106

2. Auger lever released. Unhook hold-down rod from auger support.

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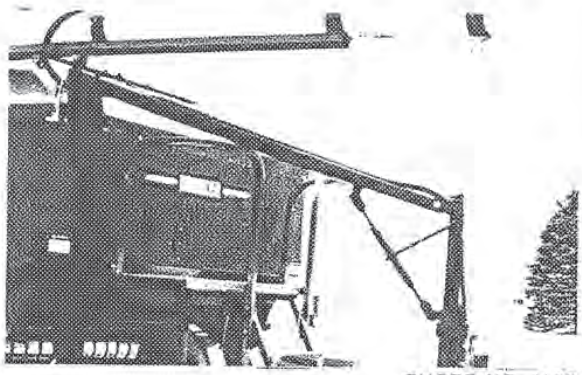


PHOTO NO. J107

3. Ratchet auger out of front cradle support.

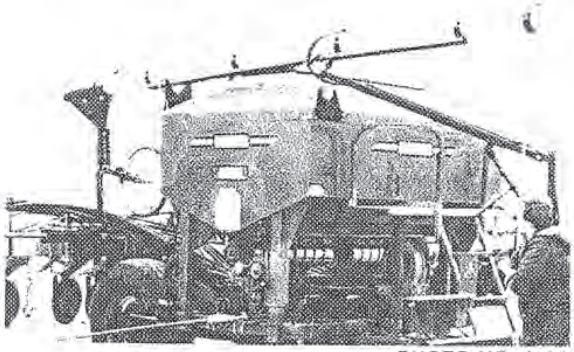


PHOTO NO. J108

4. Pull rope to lift auger out of rear cradle and maneuver to the desired position. With the hopper end of auger on the ground, lower the auger to the correct height for filling, by using the ratchet. Reverse procedure for transport. Make sure the auger is secured both in the front and rear saddle before transport.

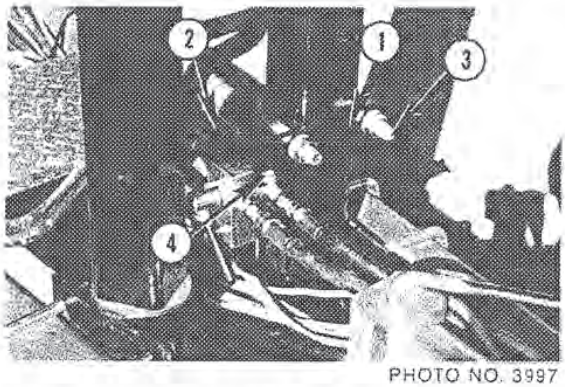
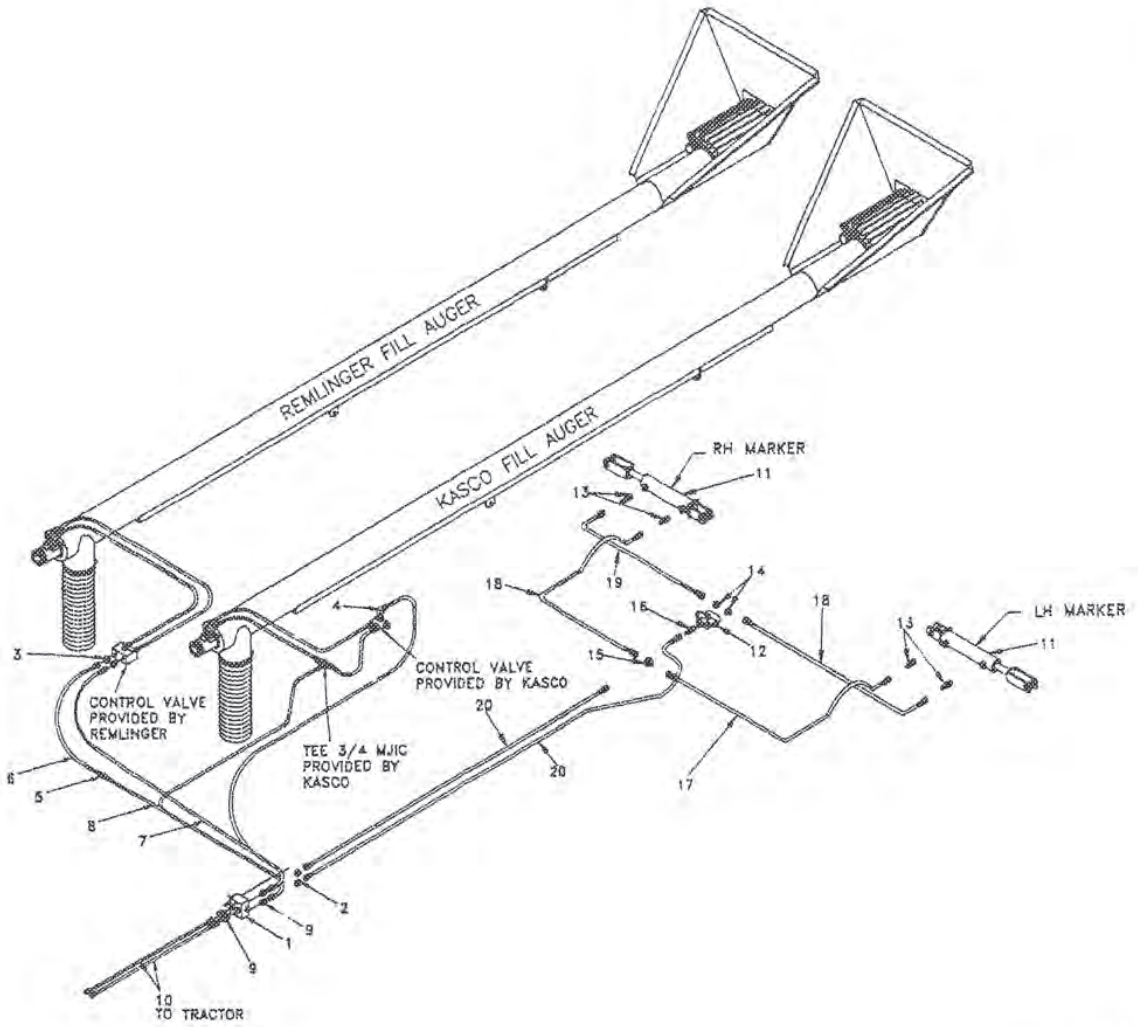


PHOTO NO. 3997

Install hydraulic selector valve using selector valve anchor (Arrow 1) and rear strap (Arrow 2) with (2) 3/4 x 4" hex bolt (Arrow 3) and (2) lockwashers and hex nuts. Install (1) 5/16 x 1 3/4" hex bolt (Arrow 4) with whiz lock nut. Install hydraulic plumbing as shown in diagram on page 42.

OPTIONAL HYDRAULICS
MARKERS & FILL AUGERS

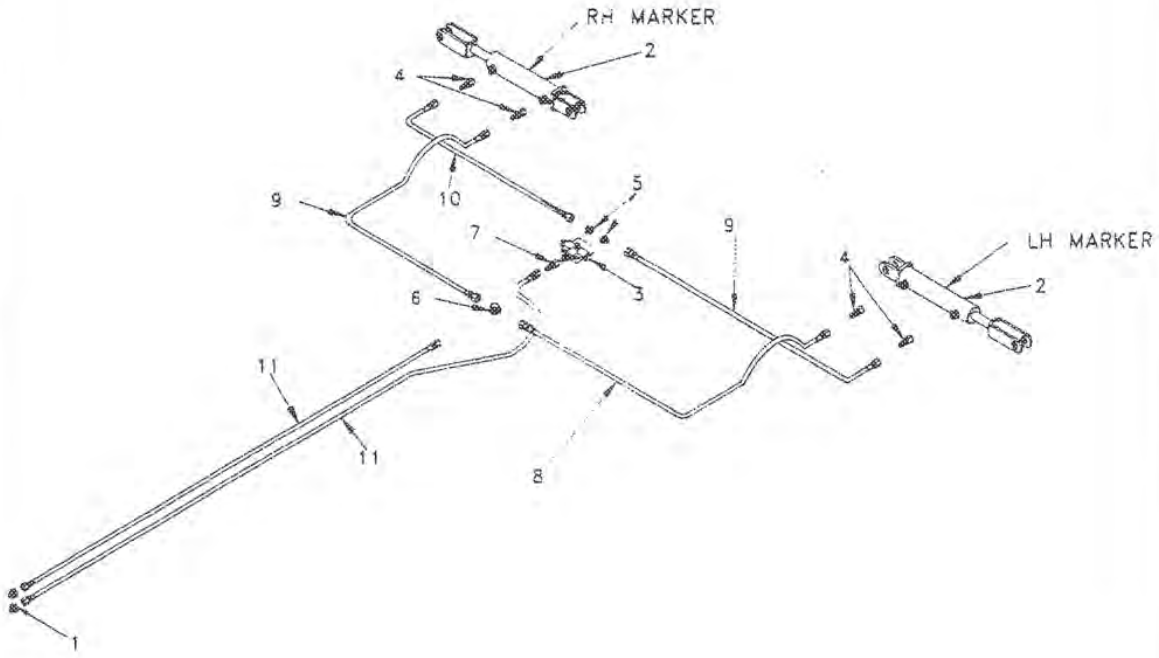


HINIKER P/N 80305509, 80305585 & 80305586 DWG. NO. 3779

REF. NO.	PART NUMBER	DESCRIPTION	QTY.	REF. NO.	PART NUMBER	DESCRIPTION	QTY.
1	80305516	HYD Valve	1	12	805-003-026	Sequence Valve	1
2	203-35510	O-Ring Pipe Plug	2	13	956-008-024	Restrictor Fitting	4
3	956-003-003	Fitting-Straight Adapter 1/2 MNPT x 9/16 MJIC	2	14	956-005-001	Fitting-Elbow 90°	2
				15	956-007-003	Fitting-Tee	1
4	956-005-003	Fitting-Elbow 90° 1/2 MNPT x 9/16 MJIC	1	16	956-003-001	Fitting STR. APT. 3/4 ORB x 9/16 MJIC	1
5	209-01019	Union 3/4 MJIC (2)	1	17	957-001-074	40' Hose Assy 3/8 x 240"	1
6	957-005-021	Hose Assy 3/8 x 50"	1		957-001-074	30' Hose Assy 3/8 x 240"	1
7	957-001-074	Hose Assy 3/8 x 240"	1	18	957-001-079	40' Hose Assy 3/8 x 260"	2
8	957-005-003	Hose Assy 3/8 x 191"	1		957-001-079	30' Hose Assy 3/8 x 260"	2
9	956-003-001	STR-ADPT 9/16 MJIC x 3/4 MORB	4	19	957-004-080	40' Hose Assy 3/8 x 284"	1
10	957-004-014	Hose Assy 3/8 x 318"	2		957-004-080	30' Hose Assy 3/8 x 284"	1
11	624129	2 1/2 x 24 CYL Assy PMC #AR-265	2	20	957-004-014	40' Hose Assy 3/8 x 318"	2
			1		957-004-014	30' Hose Assy 3/8 x 318"	2

JM-22-0000410

HINIKER MARKER HYDRAULICS



HINIKER P/N 80305585, 80305586 DWG. NO. 3777

REF. NO.	PART NUMBER	DESCRIPTION	QTY.	REF. NO.	PART NUMBER	DESCRIPTION	QTY.
1	957-004-014		2	8	957-001-074	40' Hose Assy 3/8 x 240"	1
2	624129	2 1/2 x 24 CYL Assy PMC #AR-265	2		957-001-074	30' Hose Assy 3/8 x 240"	1
3	805-003-026	Sequence Valve	1	9	957-001-079	40' Hose Assy 3/8 x 260"	2
4	956-008-024	Restrictor Fitting	4		957-001-079	30' Hose Assy 3/8 x 260"	2
5	956-005-001	Fitting-Elbow 90°	2	10	957-004-080	40' Hose Assy 3/8 x 284"	1
6	956-007-003	Fitting-Tee	1		957-004-080	30' Hose Assy 3/8 x 284"	1
7	956-003-001	Fitting STR. APT. 3/4 ORB x 9/16 MJIC	1	11	957-004-014	40' Hose Assy 3/8 x 318"	2
					957-004-014	30' Hose Assy 3/8 x 318"	2

JM-22-0000411

HINIKER MARKER ASSEMBLY

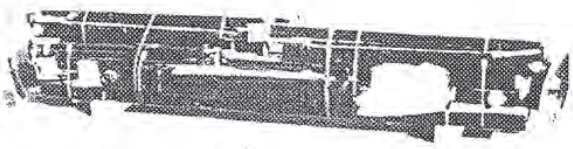


PHOTO NO. 4068

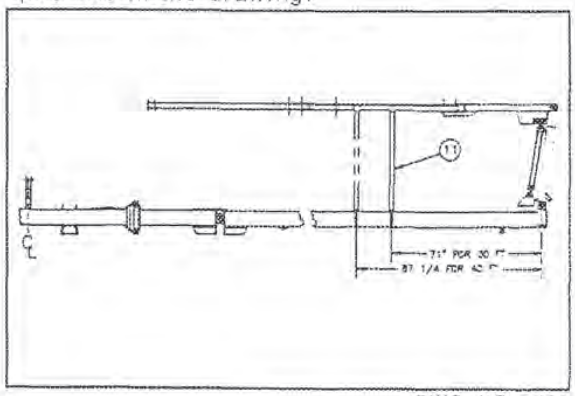
Remove all bands from the shipping bundle. Attach the base tube welds (Item 1) using the 1 5/8" by 11" pin. Secure the pin using (2) 3 8" x 2 3/4" bolts, lock washers and nuts. Let the base tube rest on the stops on the wing toolbar end plate.

Attach the upper arm welds (Item 4) to the base tube welds using the 1 1/2" by 10 1 8" pin and (2) 3/8 x 2 1/2" bolts. Support the end of the upper arm weld using a saw horse.

Attach the right outer marker assembly to the upper arm weld on the right end of the toolbar using a 3/4 x 4 1/2" bolt and two way locknut. **NOTE:** the marker disc throws soil out.

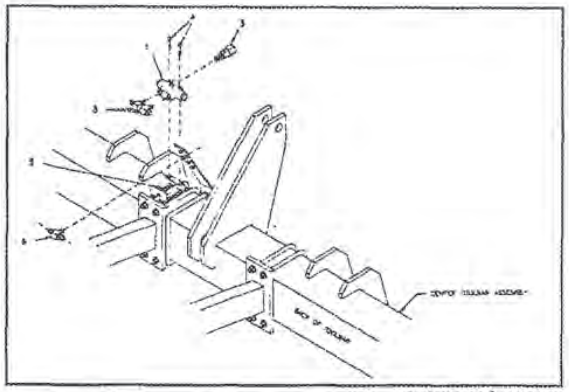
Secure the right outer marker assembly with a 3/8 x 4 1/2" bolt, lockwasher and nut. Do the same on the left side of the machine.

Attach the rest welds to the wing toolbars as shown in drawing number 3762. Secure rest welds using the 3/4 inch u-bolts lockwashers and nuts. Make sure they are at the dimension specified in the drawing.



DWG. NO. 3762

Attach the valve mounting bracket (Item 5) to the center toolbar assembly. Use the two 1/2 hose clamps to secure the valve mounting bracket. If the suitcase weight adapter is installed, use the outer left u-bolt to secure the valve mounting bracket as shown in drawing number 3763.



DWG. NO. 3763

Turn a 3/4 ORB to 9/16 JIC fitting adapter (Item 2) into the in port of the sequence valve. Turn a 90° elbow (Item 3) into both ports on the rear of the sequence valve.

Attach the sequence valve assembly to the valve mounting bracket using (2) 3/8 x 1 1/2" bolts, (Item 4) lockwashers and nuts.See pages 43 and 16 for hydraulic hosing. Attach a 3/8 x 3/8" long hose to the straight adapter going into the sequence valve.

Attach a 3/8 x 3/8" long hose to the bulkhead tee fitting (Item 6) after securing it to the bulkhead plate. Mount the base end of the 2 1/2 x 24" stroke hydraulic cylinders to the wing toolbars using the pin provided with the hydraulic cylinder.

Attach hoses to cylinders using restrictor fitting.

WARNING: BEFORE ATTACHING HYDRAULIC MARKER CYLINDERS TO MARKER ALL CAPTIVE AIR MUST BE REMOVED FROM THE SYSTEM.

Support marker fold cylinders on wooden blocks so rods can be extended and retracted without interference.

Connect hoses to the tractor. Fully extend and retract marker cylinder at least two times, maintaining hydraulic pressure at full extension for at least 30 seconds. Then extend

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cylinders one more time, maintaining pressure at full extension for one minute. This allows all air to escape from the marker cylinders.

⚠ WARNING: BE SURE CYLINDERS AND ATTACHING HOSES ARE FULLY CHARGED WITH OIL BEFORE OPERATING SYSTEMS. FAILURE TO DO SO WILL ALLOW MARKERS TO FALL RAPIDLY WHEN ATTEMPTING TO LOWER FROM TRANSPORT POSITION.

Remove the wood blocks and lower the rod end of the cylinder. Attach rod end of the marker lift cylinders to the guide strap between the ears on the upper arm weld. Use the 1 x 5 1/32" pin and secure the pin in the slots using 5/16 by 2 spring pin and flat washers.

Activate the tractor hydraulic system until the marker cylinders are fully extended. Hold the tractor lever in that position for several minutes to purge air out of the system. Cycle the marker system part way up and down several times to purge air from the system. Raise the marker very slowly the first time.

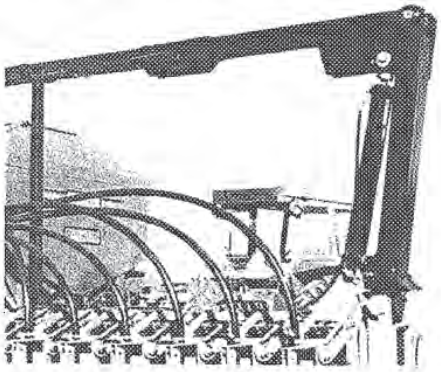


PHOTO NO. 4069

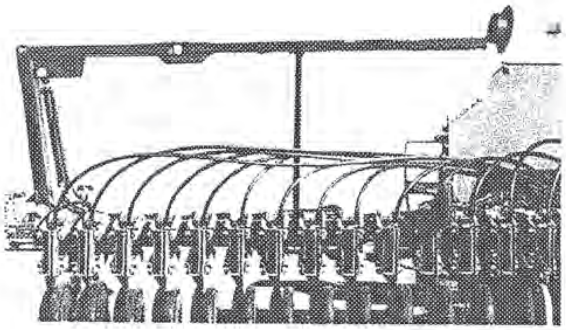


PHOTO NO. 4070

SOIL DEFLECTOR

Remove the parts for the right and left scrapers from the box. Attach the right hand soil deflector bracket (Item 1) to the right hand row unit using the 5/16 x 1 carriage bolts (Item 2) and 5/16 whiz lock nuts a s shown in photo 4062A. Do the same for the left hand soil deflector bracket on the left row units.

Secure the soil deflector pad (Item 30 to the soil deflector bracket using (2) 3/8 x 1 carriage bolts (Item 4), lockwashers and nuts as shown in photo 4061A. The carriage bolt must be assembled with the head below the plastic soil deflector pad so that soil and plant material will not catch on the bolts and nuts.

Adjust the bracket and the soil deflector pad so that there is about a 1/8" gap between the soil deflector pad and the row unit coulter as shown in photo 4062A. Tighten all the carriage bolts at this time.

The soil deflector should be adjusted under field conditions as part of setting the air seeder toolbar.

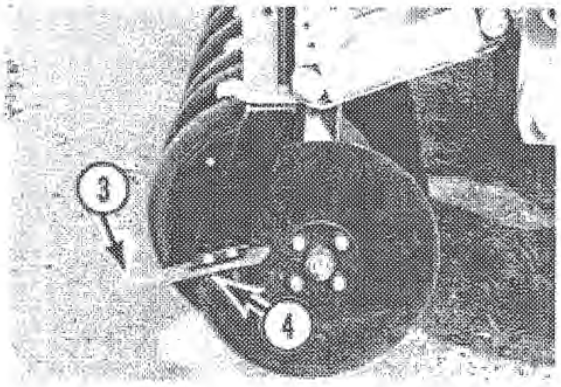


PHOTO NO. 4061A

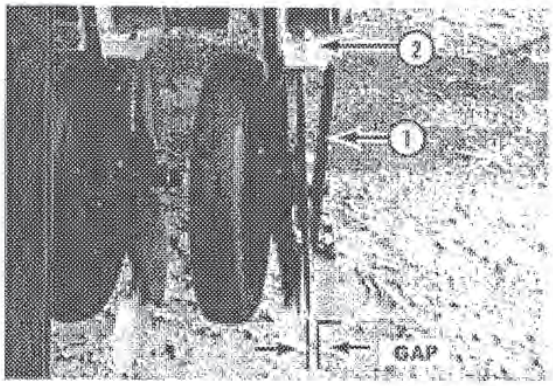


PHOTO NO. 4062A

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BIN LEVEL

The Bin Level Sensor is used to detect low bin seed levels. When used in with the 5815 Blocked Seed Tube Detector for model 5824 Seeder or with the 360-010-000 base kit for the model 4836 Seeder, the system will warn the operator when the seed level falls below the sensor. This level is determined by the placement height of the sensor in the bin.

BIN LEVEL SENSOR-INSTALLATION

To start the Bin Level Sensor installation, locate and center punch a spot on the BACK side of the seed bin, approximately 1 inch below the inside cross-member. Drill a 3/4 inch hole for the sensor cable to feed through.

NOTE: Make sure the seed bin cross-member located on the inside of the bin is not in the way of the hole.

On year 2000 models of the 5824 and 4836 seeder carts the holes for mounting the bin level sensor mounting bracket are pre-drilled into the bin cross member. On earlier models use the bin sensor bracket and use it as a guide to mark two places on the cross member: Bottom inside of the seed bin (see photos 3128 & J103). Center punch and drill both holes with a 9/32 inch drill.

Use the 1/4-20 x 3/4 hexhead cap screws and 1/4-20 Whiziok nuts and bolt the bracke to the frame cross-member. Use the #10-32 x 1/2 inch roundhead screws, #10 split washers, and #10-32 hex nuts to secure the bin level sensor to the bracket.

The bin level sensor was changed in 1999. The first version mounted horizontally as shown in photo 3128. The new version mounts vertically as shown in photo J103.

Multiple holes are provided for bin alarm set-point adjustment.

Route the bin level sensor cable through the hole previously drilled in the seed bin wall and move the grommet down the cable. Inset the grommet in the drilled hole to seal it.

Cable tie the bin level sensor cable to the underside of the cross-member to prevent unwanted movement.

Connect the sensor cable to 10' or 20' bin level extension cables and route up to the 5815 console mounted in the tractor cab. Connect to the console pigtail marked bin level. Secure all wiring using proper length wire ties.

NOTE: Allow room at hitch for proper turning.

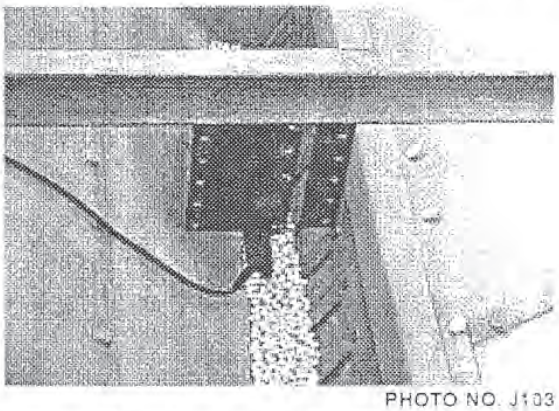


PHOTO NO. J103

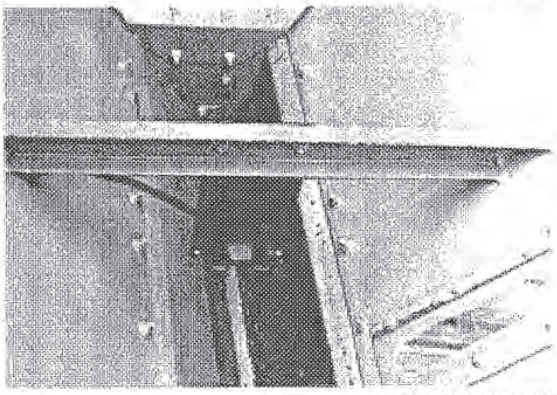


PHOTO NO. 3128

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BLOCKED SEED TUBE DETECTOR WITH DUAL CLUTCH MACHINES

Install the Dual Clutch Box bracket in a convenient location. Mount the Blocked Seed Tube Detector to the Dual Clutch Box using the two mounting plates and hardware as shown in figure 1.

Connect the cables marked Power to the proper consoles, then route to the battery and connect as shown in figure 2.

Connect the Adapter cable to the proper connections on the Dual Clutch Box and the Blocked Seed Tube Detector as shown in figure 2. There is no connection to the cable maked Clutch on the Blocked Seed Tube Detector. Connect the wto 20 foot Seed Sensor Cables to the Left and Right bank of sensors at the center of the Seeder as shown in figure 2. the 1 foot Jumper cable between the Left and Right Sensor bank in not used. Route these cables to the hitch, connect to the 10 foot Seed Sensor cables, and continue to route to the Console area. Connect these cables to the adapter ends marked Left and Right.

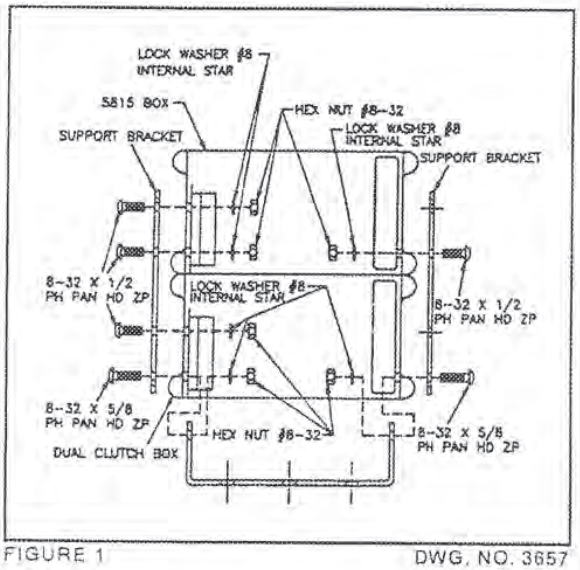


FIGURE 1 DWG. NO. 3657

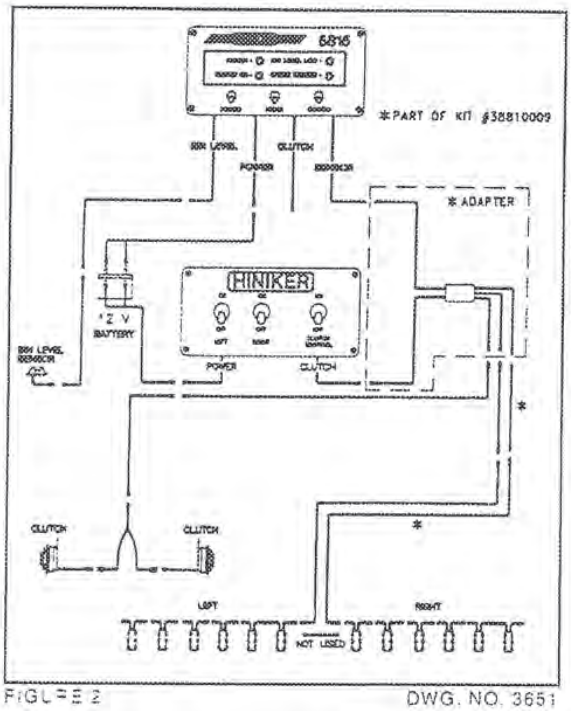


FIGURE 2 DWG. NO. 3651

OPERATION

Refer to the 5815 Operators manual for a description of the various funcitons of the Blocked Seed Tube Detector. For use with dual clutch machines the Clutch switch on the blocked Seed Tube Detector will be let in the **on** position and **not** used. Clutch control will be accomplihed using the Dual Clutch Box. Use the master Clutch switch to turn the clutches on and off. The Left and Right switches will disable the **sensors** and **clutch** for the side that is turned off. This will allow the remaining side to operate normally.

NOTE: If a Warning error occurs when shutting off the Left or Right switches, reset by switching the Master clutch switch off then back on.

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HINIKER SERVICE LITERATURE

A. PARTS CATALOG - P/N 80305579

4830 parts book is available from your Hiniker dealer. It lists service parts for your machine with exploded illustrations to help you identify the correct parts. It is also helpful in assembling and disassembling.

B. OPERATORS MANUAL - P/N 80504784

The operators manual provides safety, operating, maintenance and service information about Hiniker 4831, 4832, 4833 Airdrill.

C. ASSEMBLY MANUAL - P/N 80504785

Contains set up instructions for the Hiniker 4836 Air Seeder Cart and the options available for it.

CONTACT YOUR HINIKER DEALER OR CONTACT:

HINIKER COMPANY
AIRPORT ROAD
PO BOX 3407
MANKATO, MN 56002-3407

(507)625-6621

HINIKER 4831, 4832, & 4833 AIR SEEDER

STANDARD EQUIPMENT

- 150 Bushel Seed Cart with 3 Point Hitch
- 14 GPM Hydraulic Motor and Blower
- 36 Seed Outlets - 12 Blanking Plates
- 600 Ft. Air/Seed Hose
- Dual Electric Clutches with Cab Control
- 30 Ft. or 40 Ft. Forward Folding Toolbar including Cylinders, Hoses and Gauge Wheels with correlsponding Number of 4602 Seeder Row Units
- 7" x 7" Toolbar
- SMV Emblem

Independently Mounted Seed Units Equipped With:

- 10" Single Disk Seed Openers (Minimum Row Spacing - 10 Inches)
- Parallel Linkage Suspension
- 3" x 16" Rubber Gauge Wheel w/Wrenchless Down-Pressure Adjustment
- Adjustable Seeding Depth
- Seed Firming Blade
- Adjustable Angled Steel Closing Wheel

TRANSPORT WIDTH: 16 FT.

ITEM NUMBER	DESCRIPTION	Row Spacing	APPROX. WEIGHT	LIST PRICE*
4831	150 BU Seed Cart with 30 Ft. Toolbar and 24 Row Units	15"	10,350 lb.	$ 38,950.00
4832	150 BU Seed Cart with 30 Ft. Toolbar and 36 Row Units	10"	12,050 lb.	45,940.00
4833	150 BU Seed Cart with 40 Ft. Toolbar and 32 Row Units	15"	11,700 lb.	43,280.00

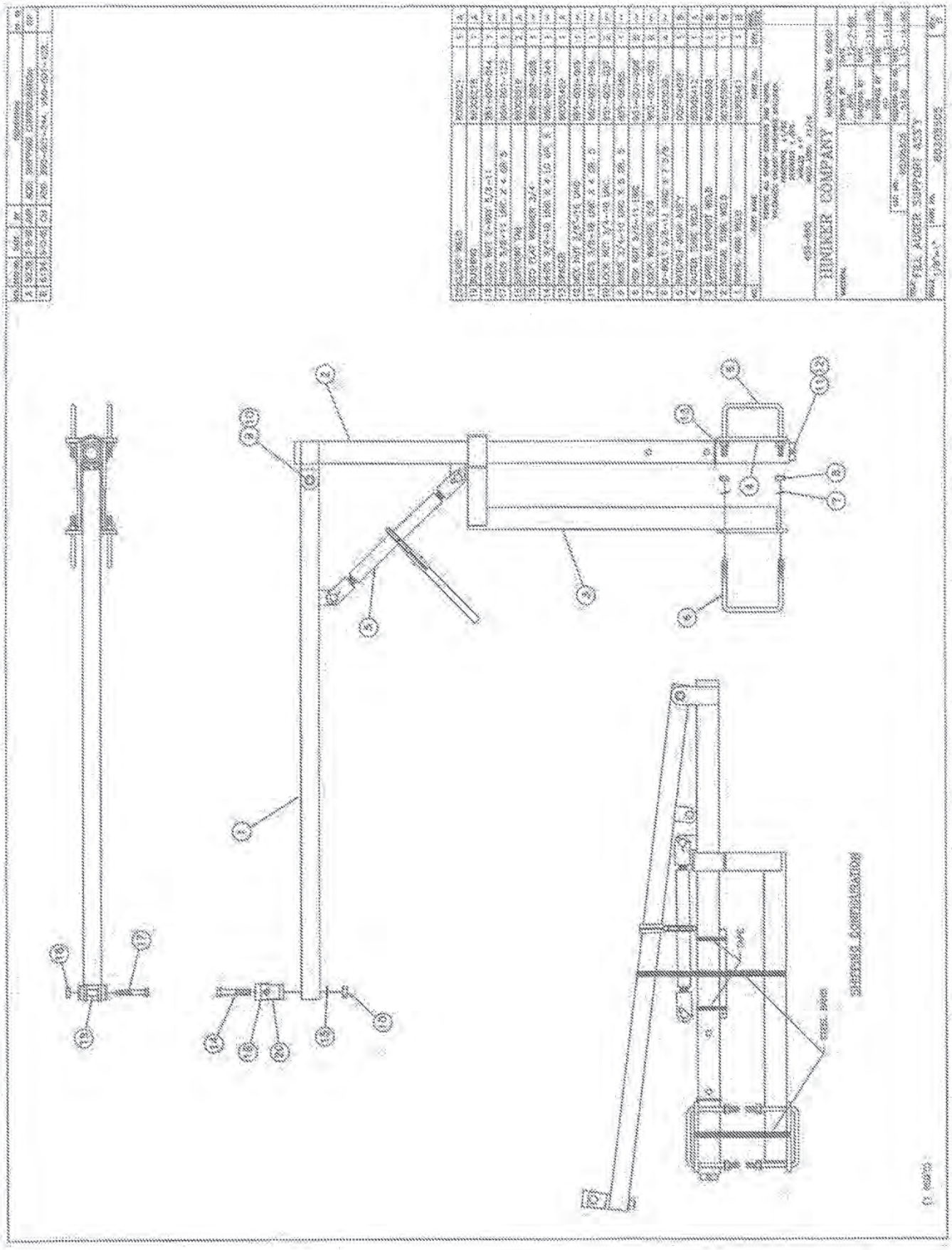
OPTIONAL EQUIPMENT

903058B6	30 Ft. Row Marker	394 lb.	$ 2,530.00
903058B8	40 Ft. Row Marker	484 lb.	2,600.00
903059G9	Auger Mount Kit (Includes Hoses from Auger Valve to Splitter Valve and from Splitter Valve to Tractor) (Does Not Include Auger) (Auger Requirement: 23 Ft. x 8" Recommended Vendor, Kasco or Remington)	313 lb.	606.00
903058B7	Soil Deflector (2 Row Bundle)	7 lb.	85.00
903059L9	Weight Bracket (Holds JD or Case Suitcase Weights)	137 lb.	270.00
910-0001-178	Ballast Blocks 28 for 30 Ft. Front Fold 38 for 40 Ft. Front Fold	32.5 lb.	8.00

*All Prices F.O.B. Mankato, MN
Subject to Change

45

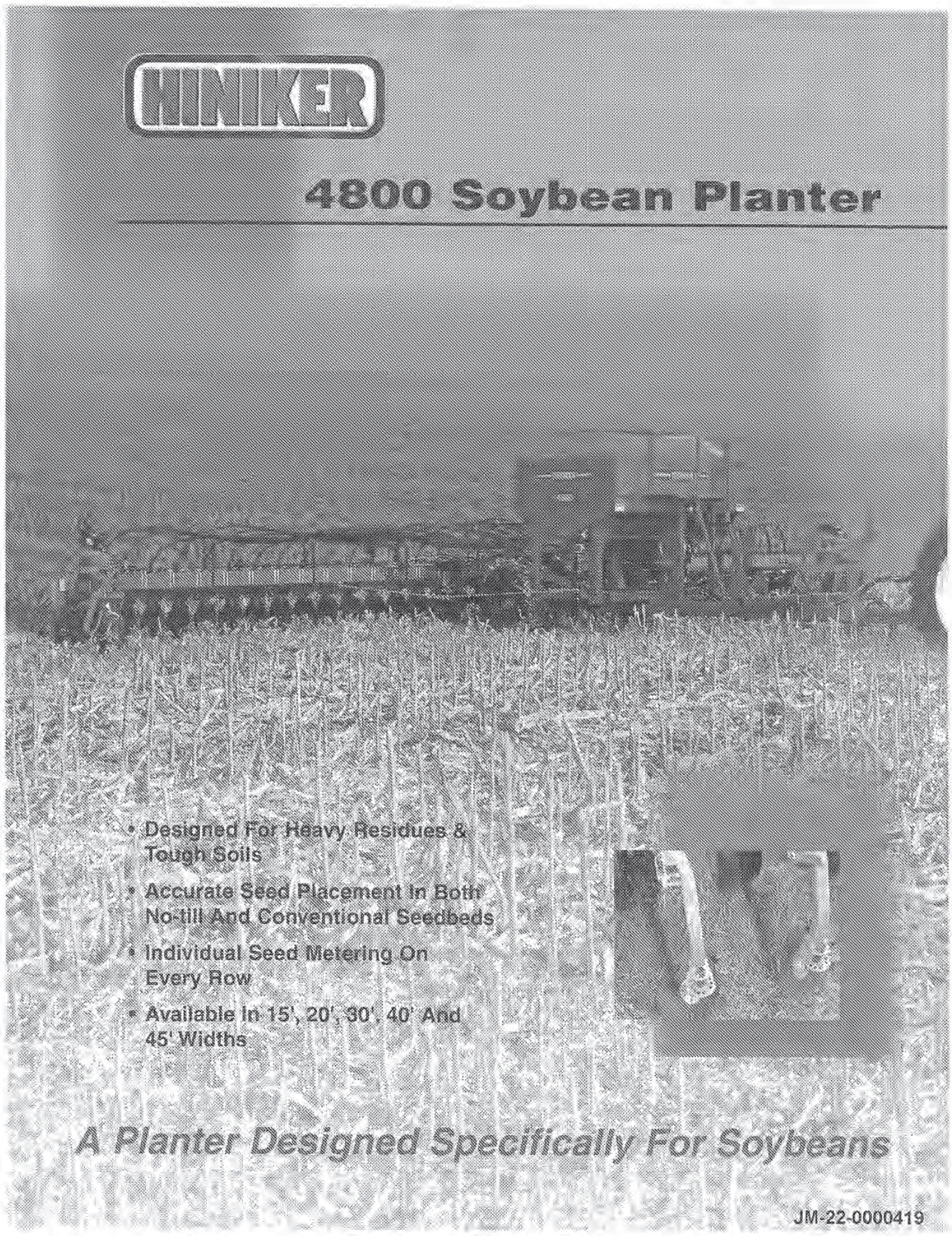
JM-22-0000417



JM-22-0000418

HINIKER

4800 Soybean Planter



- Designed For Heavy Residues & Tough Soils
- Accurate Seed Placement In Both No-till And Conventional Seedbeds
- Individual Seed Metering On Every Row
- Available In 15', 20', 30', 40' And 45' Widths

A Planter Designed Specifically For Soybeans

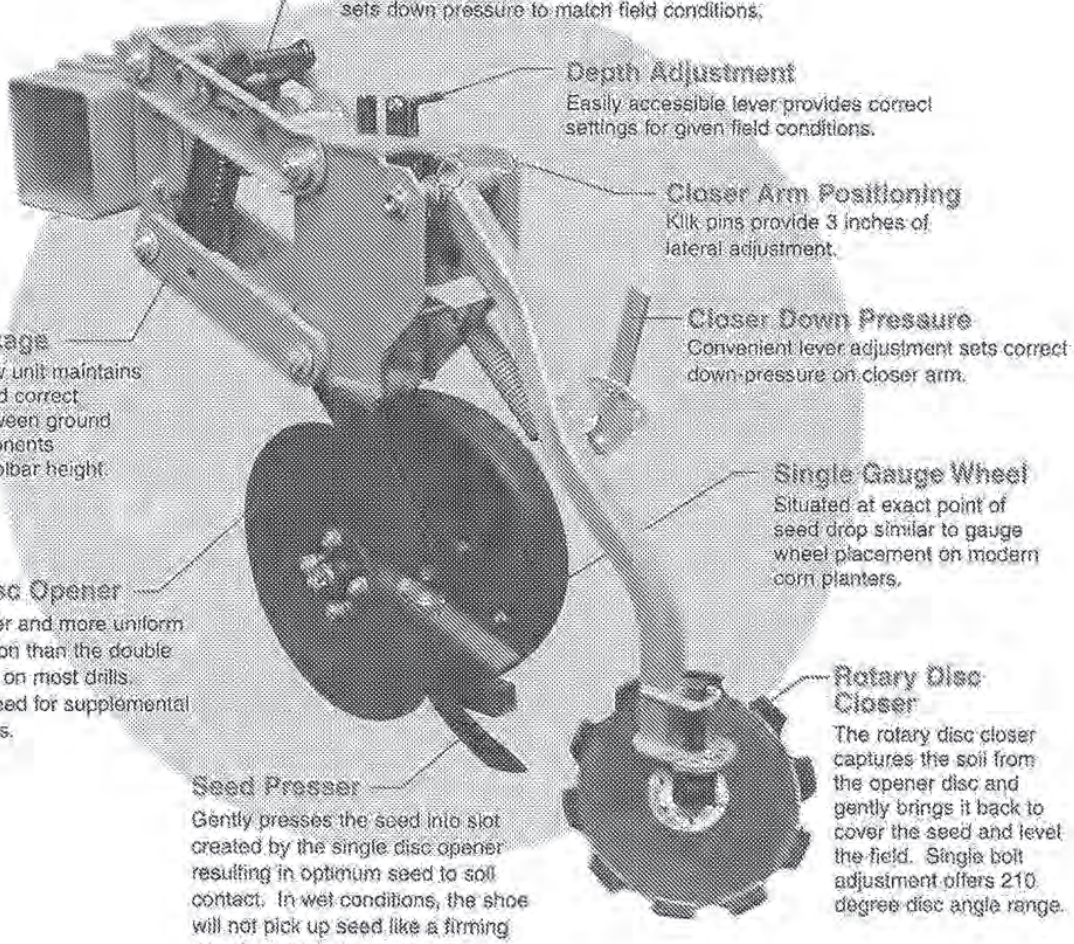
JM-22-0000419

It All Starts With
The VERSATILE 4800 ROW UNIT

Get precise depth control *and* accurate, high speed volumetric seed metering with the Hiniker 4800 Soybean Planter.

The 4800 combines the filling speed and convenience of a single large seed hopper, the versatility of a single disc seed opener, and the accurate depth control of individual "drop-point" depth gauge wheels.

Simple and accessible adjustments permit rapid transition in changing field conditions from tough no-till to soft conventional soils.



Down Pressure Adjustment
Four-notch wrenchless adjustment effortlessly sets down pressure to match field conditions.

Depth Adjustment
Easily accessible lever provides correct settings for given field conditions.

Closer Arm Positioning
Klik pins provide 3 inches of lateral adjustment.

Parallel Linkage
Ensures that row unit maintains proper depth and correct relationship between ground engaging components regardless of toolbar height.

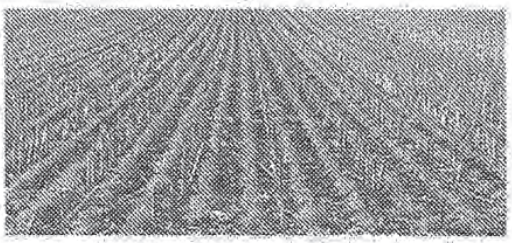
Closer Down Pressure
Convenient lever adjustment sets correct down-pressure on closer arm.

Single Gauge Wheel
Situated at exact point of seed drop similar to gauge wheel placement on modern corn planters.

Single Disc Opener
Permits easier and more uniform soil penetration than the double disc openers on most drills. Eliminates need for supplemental fluted coulters.

Rotary Disc Closer
The rotary disc closer captures the soil from the opener disc and gently brings it back to cover the seed and level the field. Single bolt adjustment offers 210 degree disc angle range.

Seed Presser
Gently presses the seed into slot created by the single disc opener resulting in optimum seed to soil contact. In wet conditions, the shoe will not pick up seed like a firming wheel or promote crusting like surface packing wheels.



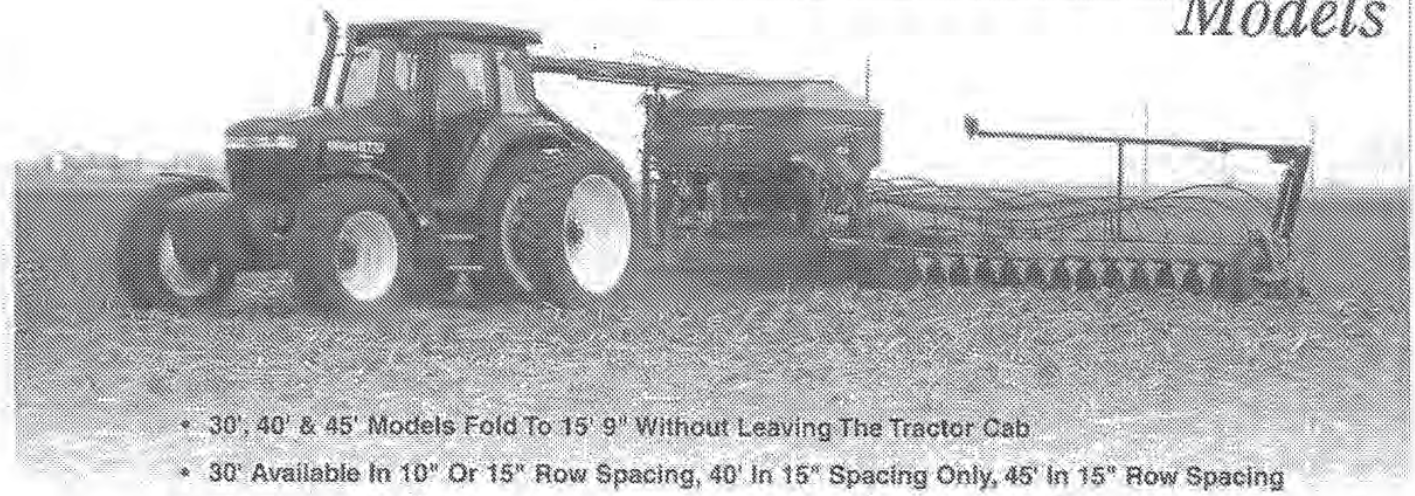
The Hiniker 4800 (15") places the row exactly 7½" between the old row and the wheeltrack area, unlike a splitter corn planter which places the seed in the corn stubble and the compacted wheel tracks.



The 4860 toolbar is hinged both horizontally, to enable 90 degree front folding, and vertically to permit wing float of as much as 15 degrees in rolling terrain.

JM-22-0000420

4860 FRONT FOLDING *Models*

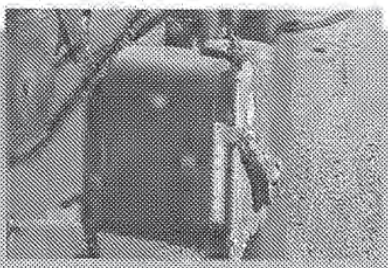


- 30', 40' & 45' Models Fold To 15' 9" Without Leaving The Tractor Cab
- 30' Available In 10" Or 15" Row Spacing, 40' In 15" Spacing Only, 45' In 15" Row Spacing
- 130 Bushel Seed Tank
- Individual Row Metering Assures Accurate Seed Count In Every Row

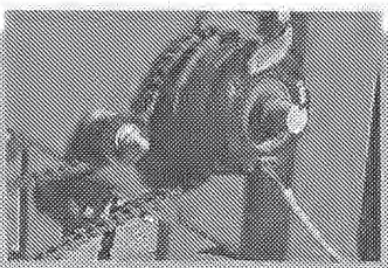
STANDARD *Features*



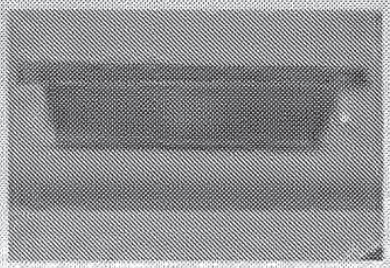
Hiniker seedcarts INDIVIDUALLY AND GENTLY METER the seed to each row, unlike air units that use a single meter which then shoots the seed through splitters and towers.



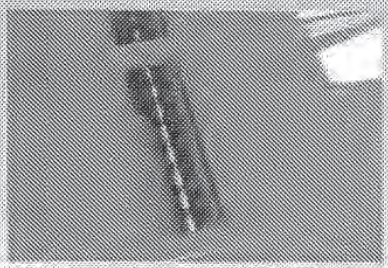
Both the 4860 and the 4824 seedcarts feature the ZERO MAX SEEDING RATE TRANSMISSION. By simply adjusting a dial on the transmission, the correct seeding rate is selected on the linear scale.



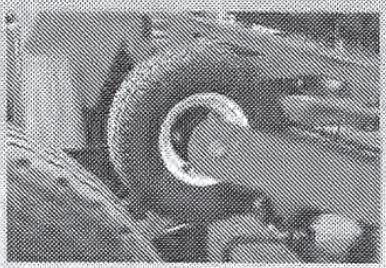
The seed metering system is ground driven allowing for UNIFORM SEED RATES regardless of ground speed. The 4860 model features two clutches permitting half of the machine to be turned off.



Two easily ACCESSIBLE SLIDE GATES permit complete hopper cleanout without any scooping.

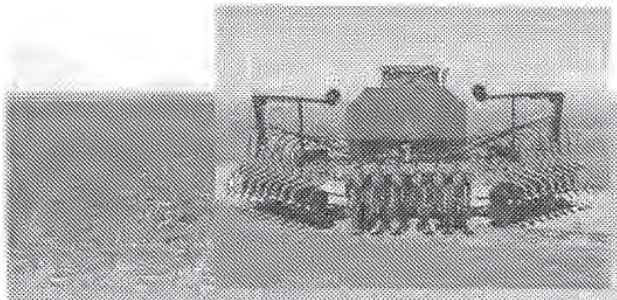


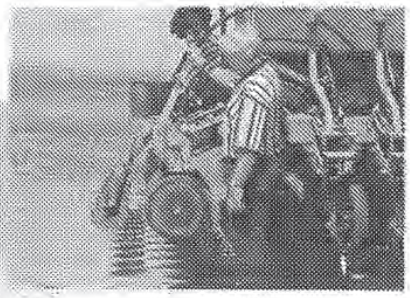
SEED HOPPER AGITATOR prevents seed bridging.



MECHANICAL DRIVE WHEEL LIFT automatically disengages seed flow when toolbar is raised, both when turning on end rows and when in transport.

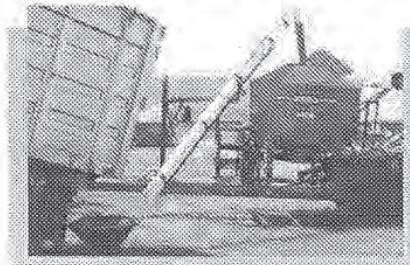
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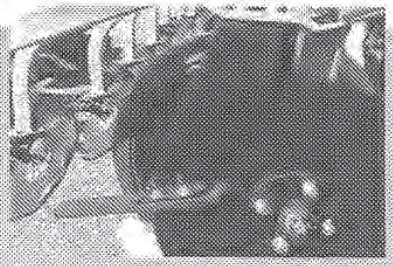


With fields often located miles apart, safe road travel has become a real concern. The 30', 40' and 45' 4860 models fold to less than 18' transport width. Vertical lockup of closer arms reduces overall transport width to 13' 6". Safety lights are standard equipment.

OPTIONAL *Features*



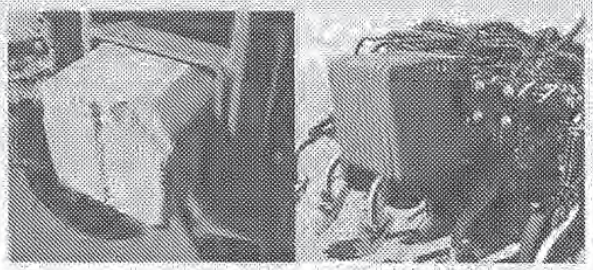
FILL AUGERS are available for both seedcart models. The auger may be used to both fill and empty the seed hopper when changing seed varieties.



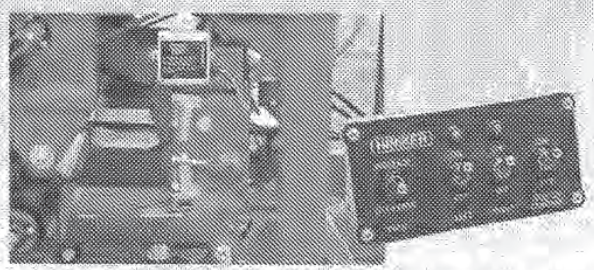
SOIL DEFLECTORS deflect soil from the opening disc back into the closing disc ensuring seed coverage.



ROW MARKERS are available for the front folding 4860 seeder. These rugged markers attach to welded on toolbar mountings and feature breakaway protection when post or tree obstructions are encountered.



When no-till conditions demand, CONCRETE BALLAST BLOCKS and SUITCASE WEIGHT BRACKETS ensure proper penetration of row units.



Add an optional REMOTE RATE CONTROL package to your 4800 seeder and adjust seeding rates from inside the tractor cab. Population monitor users can now adjust seeding rates on-the-go to match changing seed sizes or field conditions. A second adjustment switch is located on the Zero-Max seeder transmission for convenient access when calibrating seed rates.

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The First and *Only* Planter
DESIGNED SPECIFICALLY FOR SOYBEANS



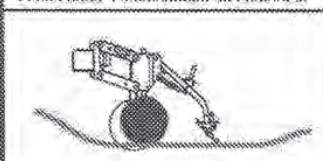
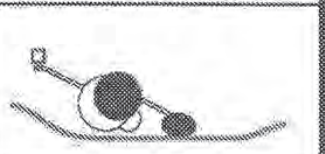
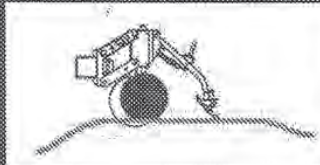
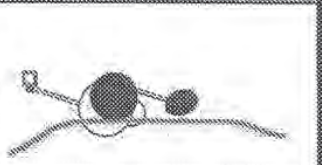
CORN PLANTERS AND DRILLS — HINIKER SOYBEAN PLANTER

SEED GERMINATION & EMERGENCE PHYSIOLOGY		CORN PLANTER	DRILLS	HINIKER SOYBEAN PLANTER
CORN	• Requires firm seed to soil contact for proper germination. • Sends narrow spiral shoot.	Firms soil tightly around seed for necessary seed to soil contact.	Not designed for corn.	Not designed for corn.
SMALL GRAIN	• Small seed requires tight seed to soil contact without air pockets. • Narrow spike emerges from shallow depth.	Not designed for small grains.	Ideally suited for all cereal grains.	Precision depth control ensures excellent stands if 10" minimum row spacing is acceptable.
SOYBEANS	• Germination less dependent on firmed soil surface. • Must push wide fragile cotyledon to soil surface.	Crusting caused by tightly firmed soil over the row may compromise emergence.	Trailing gauge wheel creates two problems: 1. Imprecise depth control requires over-seeding 2. Firmed soil over row may create crusting problems similar to corn planters.	Uniform depth and seed firming provide excellent germination. Unpacked soil over firmed seed prevents crusting and emergence problems.

Precision seed depth placement without surface crusting.

Two critical design characteristics set the Hiniker 4800 soybean planter apart from other machines that are designed primarily for corn and small grains.

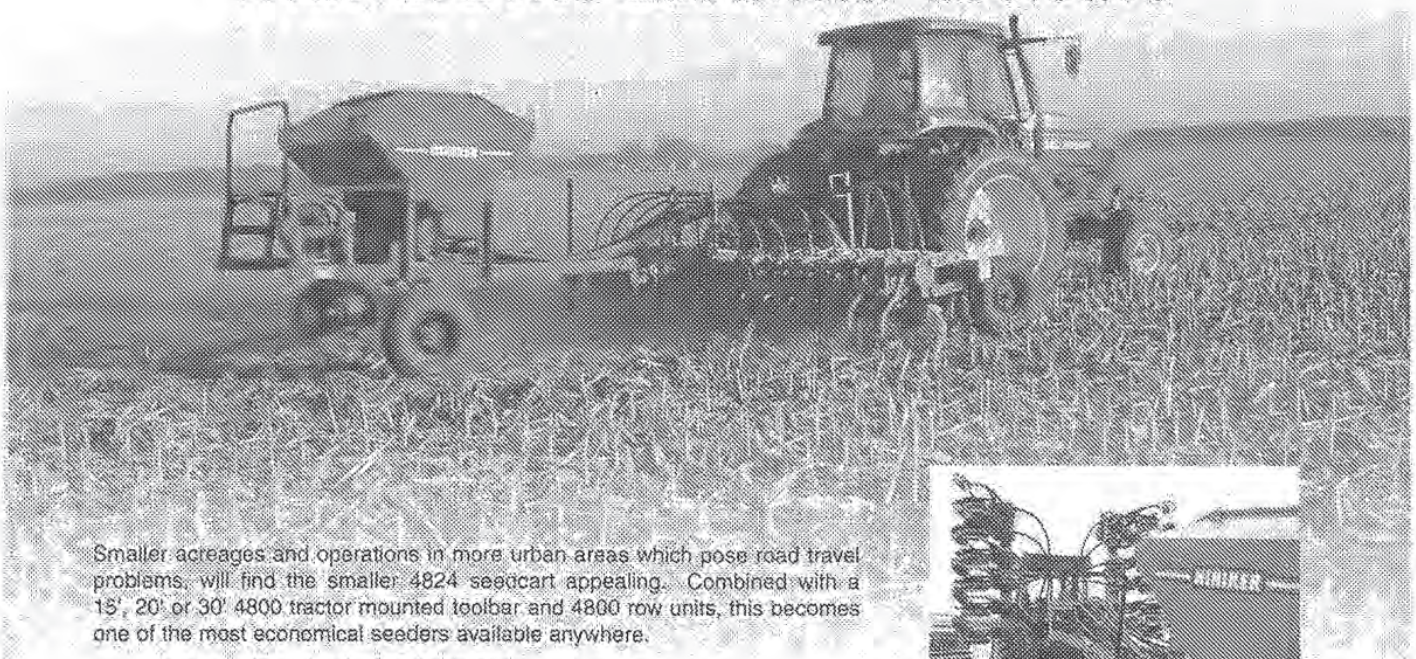
First and foremost is the unique gauge wheel/single disc opener/seed presser/rotary closer configuration. These combined components provide excellent depth control and seed-to-soil contact, along with positive, thorough covering and closing, without packing the soil over the seed. This eliminates the germination-impairing crusting that can occur in soil compacted by the press-wheels or packing wheels found on most grain drills and corn planters.

HINIKER PARALLEL LINKAGE	SINGLE ARM DRILL
	
	

Secondly, in order to work effectively each of these components needs to remain in full contact with the soil surface at all times. Hiniker utilizes a parallel linkage mounting system to keep the ground-engaging seeding and covering components in a level horizontal plane, even as the individual row units move up and down through an 8 inch range in response to surface irregularities.

The illustrations (above) contrast the ability of a Hiniker planter to maintain proper seeding depth and soil coverage with that of drills which use only a single radial mounting arm.

4824 SEEDCART
With Tractor Mounted Toolbars



Smaller acreages and operations in more urban areas which pose road travel problems, will find the smaller 4824 seedcart appealing. Combined with a 15', 20' or 30' 4800 tractor mounted toolbar and 4800 row units, this becomes one of the most economical seeders available anywhere.

- **60 Bushel Seed Capacity (100 Optional).**
- **15' & 20' Non Folding, 20' & 30' Folding Toolbars.**
- **10" Or 15" Row Spacing Option On Non Folding 15' & 20' Models.**

The 20' vertical fold is ideal for road travel, folding to only 11' 2" transport width.

AIR SEEDER & SEEDCART
Specifications

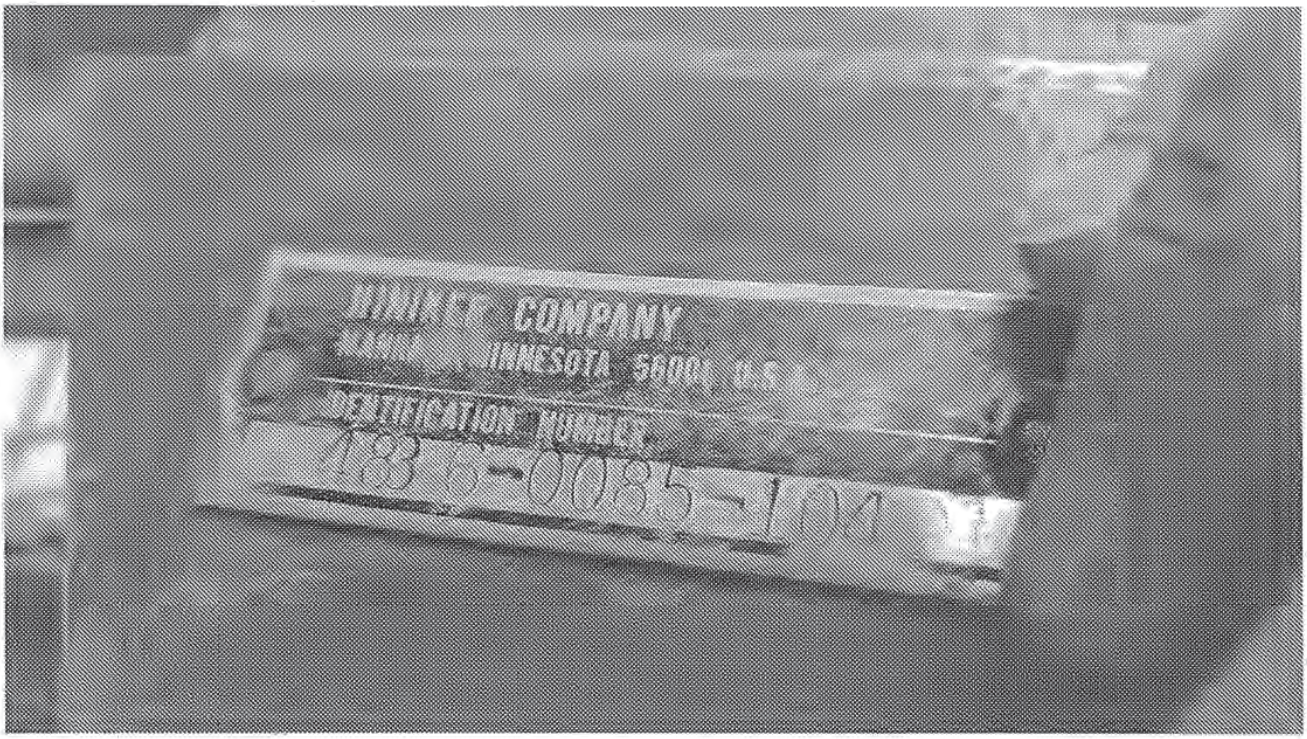
MODEL	TOOLBAR	# ROWS	ROW WIDTH	TRANSPORT	HOPPER BU	WEIGHT W/CART
4858	15' Rigid	18	10"	15' 8"	60	5,959
4859	15' Rigid	12	15"	15' 8"	60	4,993
4861	20' Rigid	24	10"	20' 8"	60	7,026
4862	20' Rigid	16	15"	20' 8"	60	5,738
4863	20' Vert Fold	16	15"	11' 2"	60	6,377
4864	30' Vert Fold	24	15"	20' 9"	60	7,991
4865	30' Front Fold	24	15"	15' 9"*	130	10,806
4866	30' Front Fold	36	10"	15' 9"*	130	12,734
4867	40' Front Fold	32	15"	15' 9"*	130	12,308
4868	45' Front Fold	36	15"	15' 9"	130	13,620

* 13' 6" with closer arms manually locked upright.

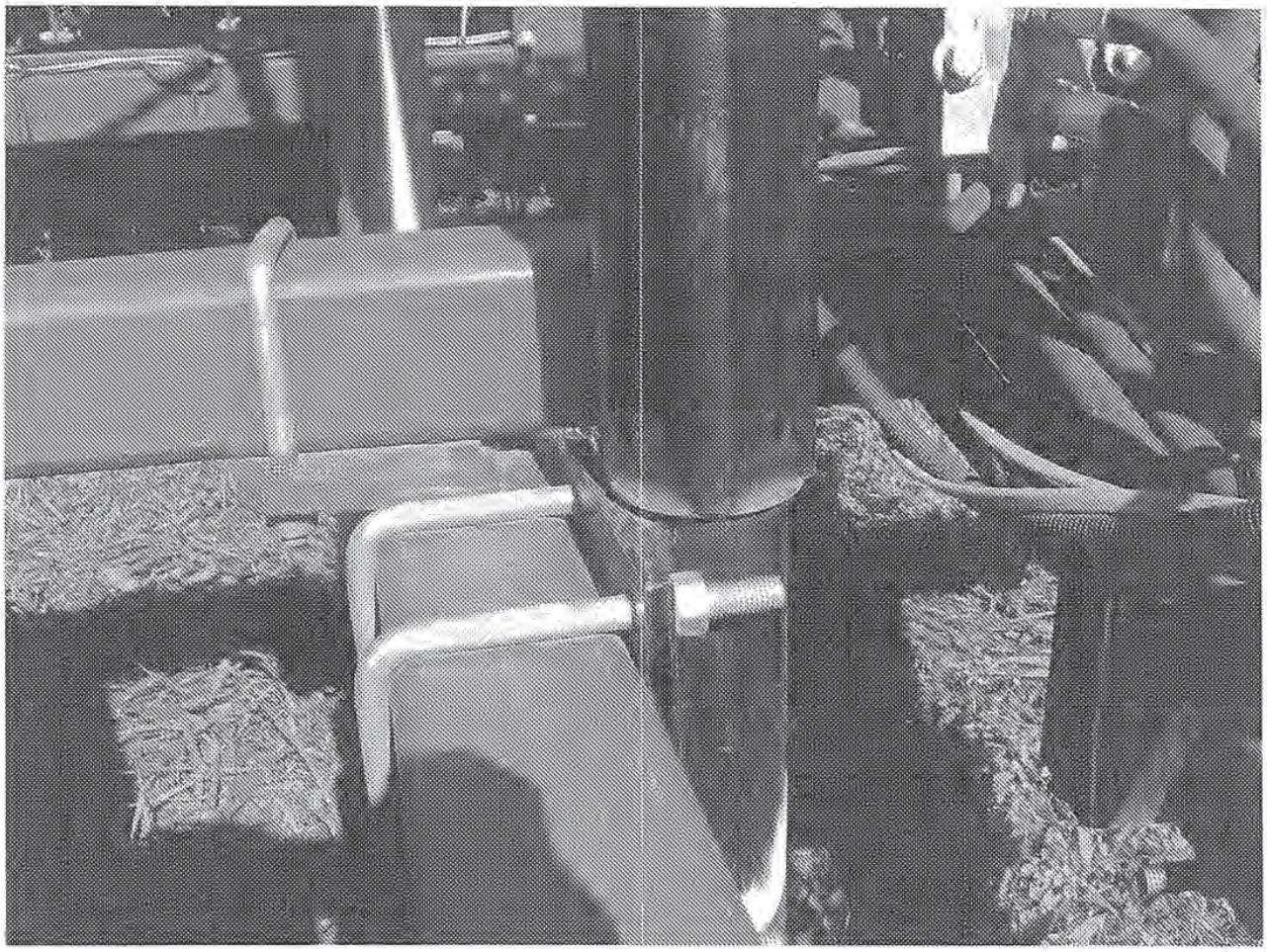
HINIKER

HINIKER COMPANY
58766 240 St. • P.O. Box 3407
Mankato, MN 56002-3407
Phone (507) 625-6621
Fax (507) 625-5883
www.hiniker.com

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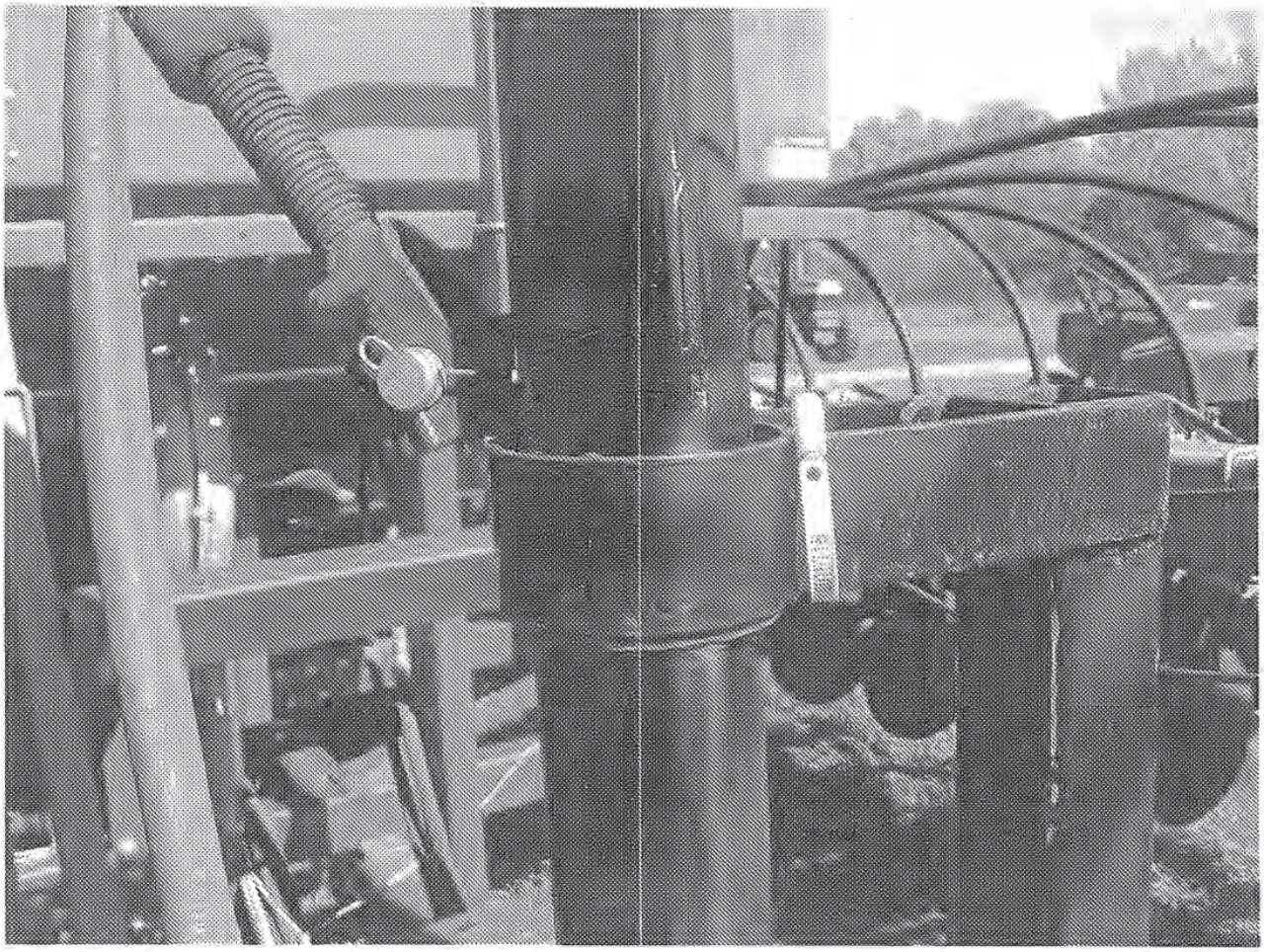
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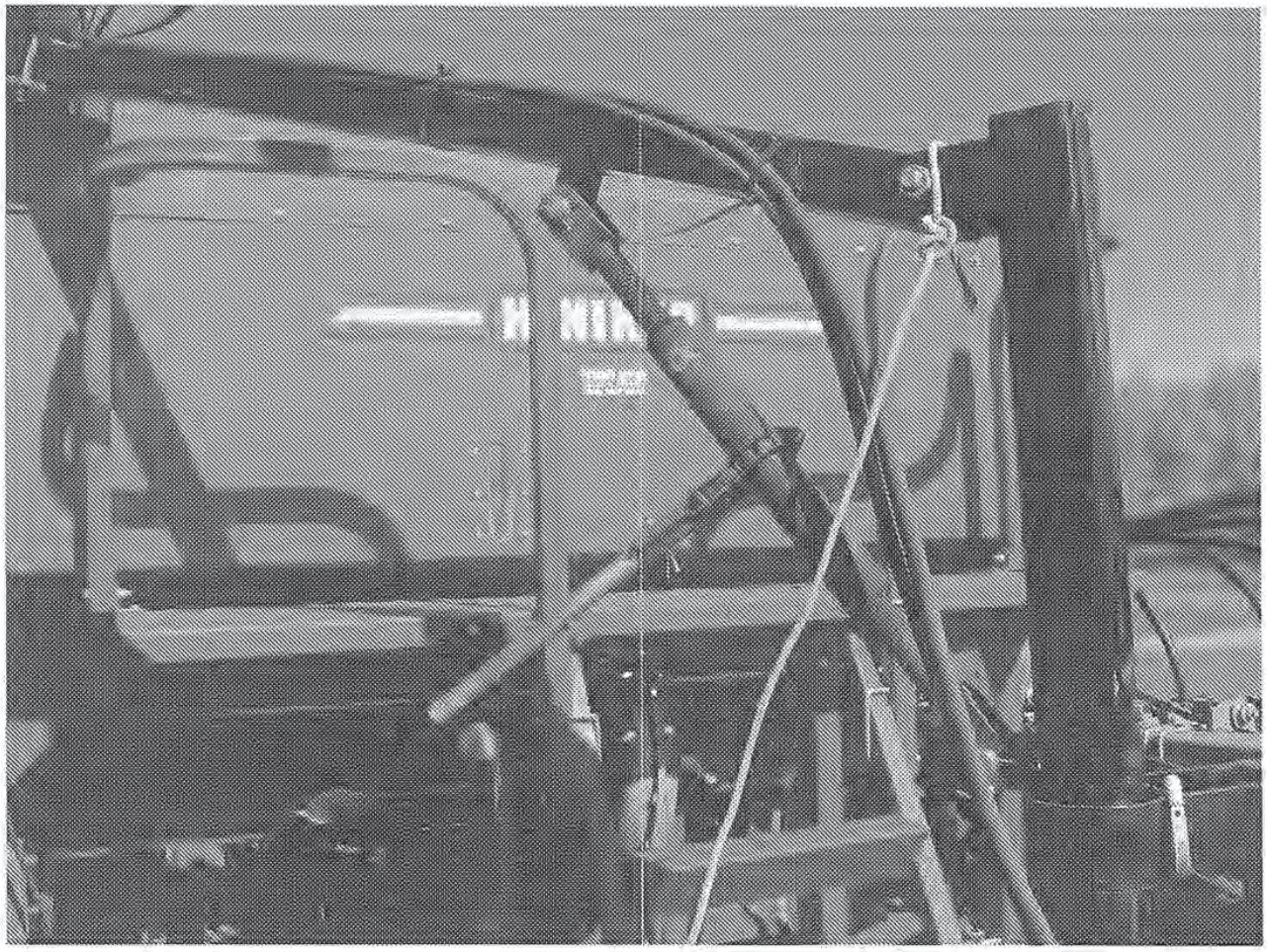
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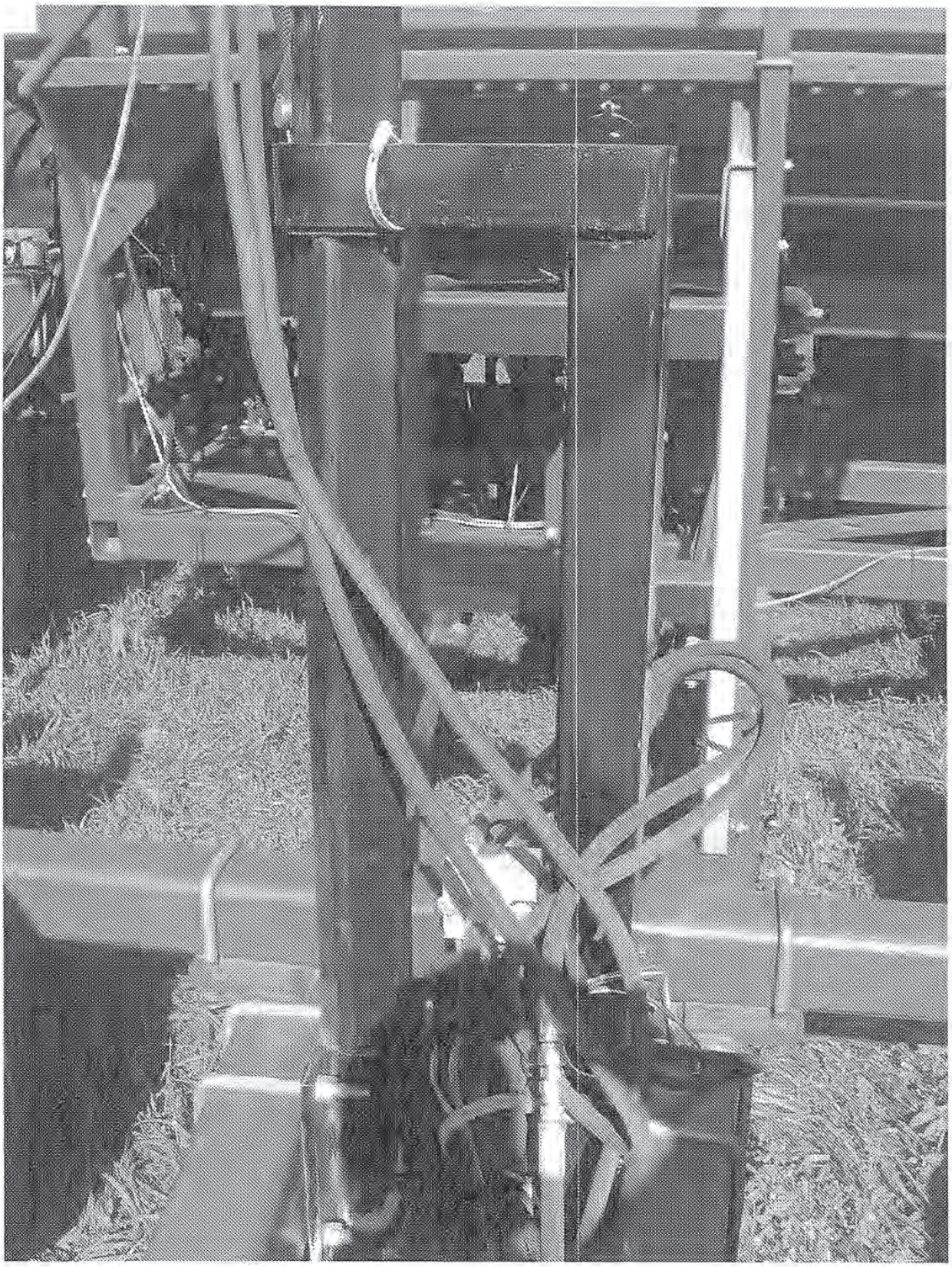
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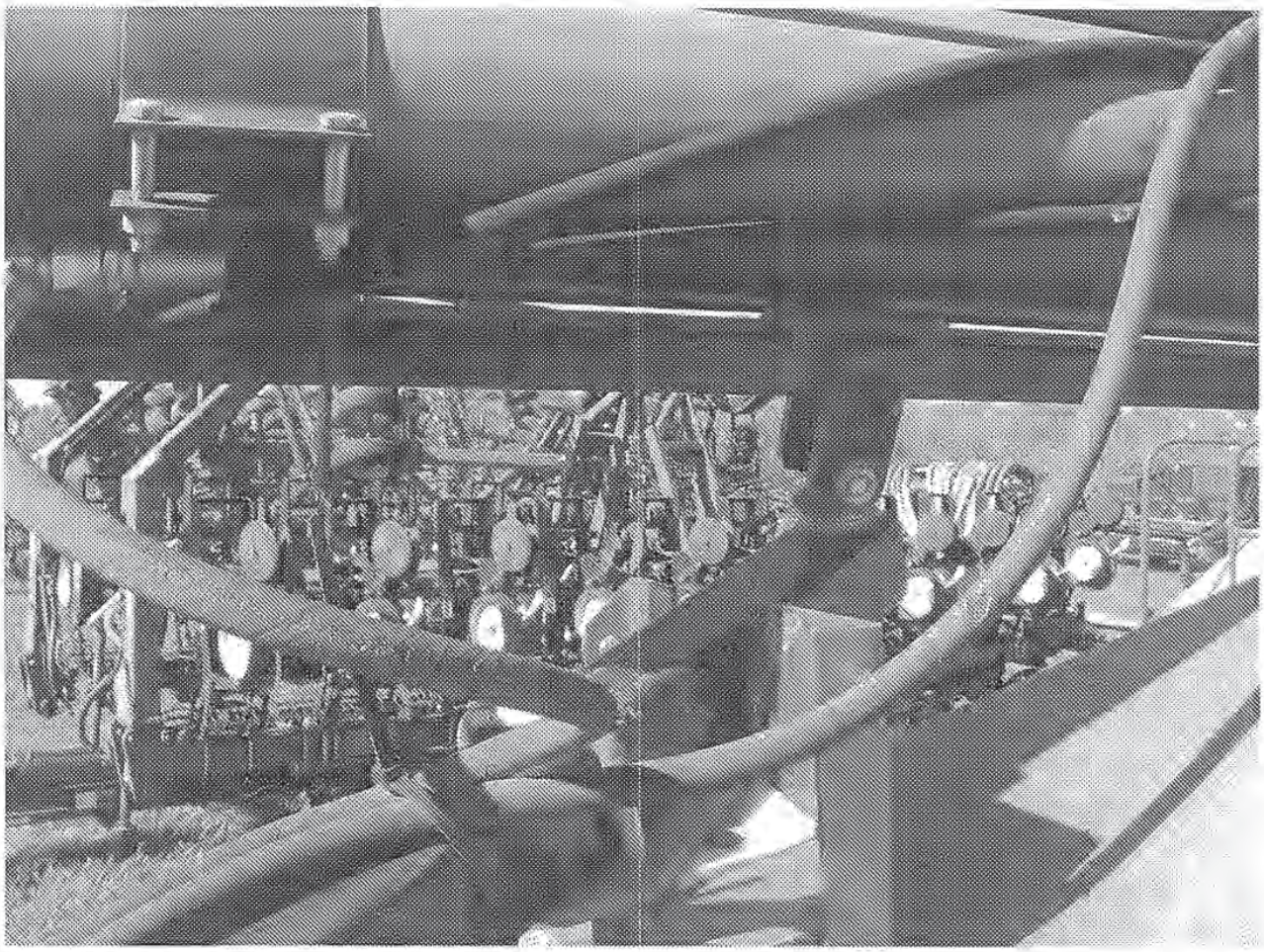
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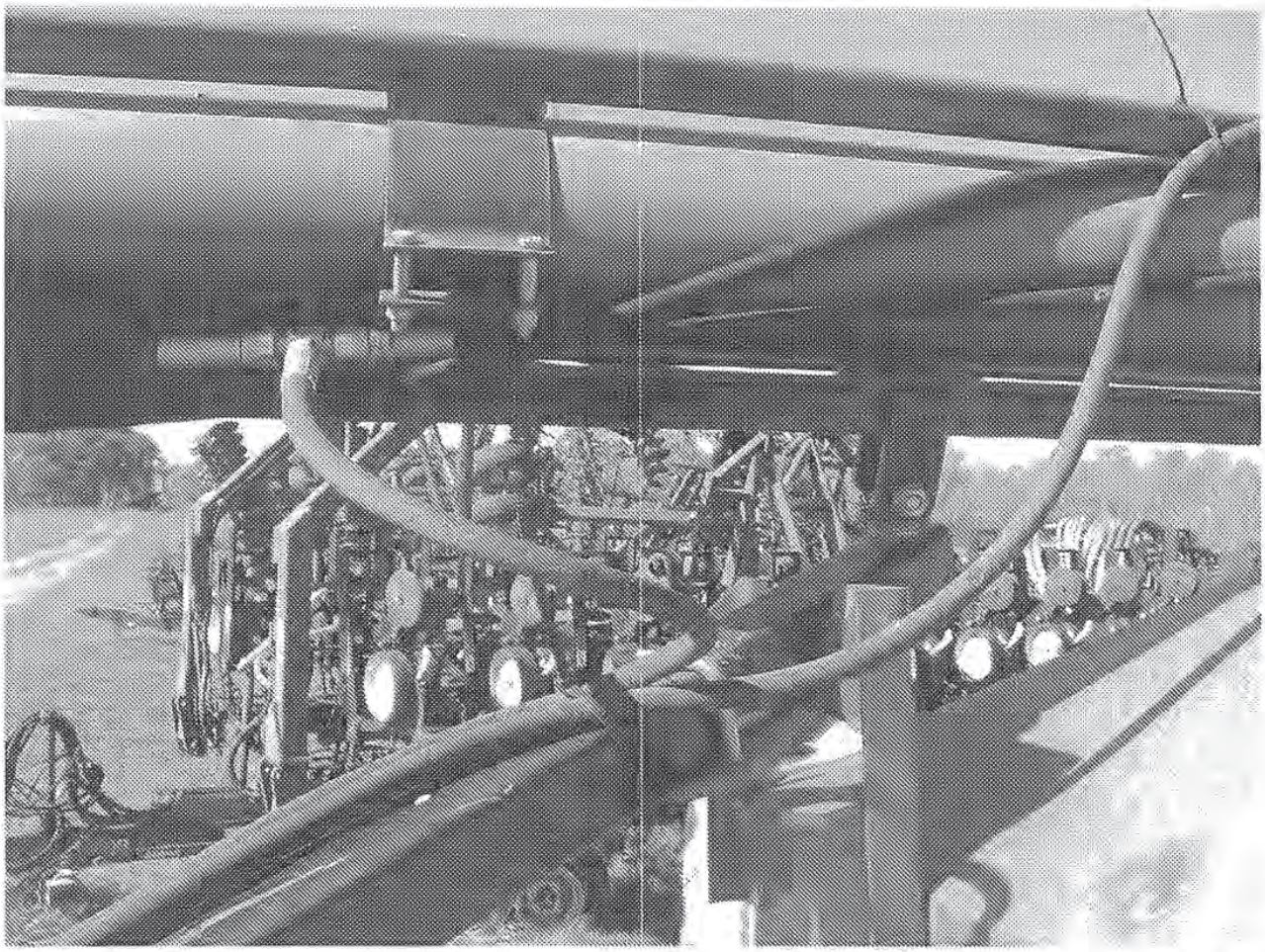
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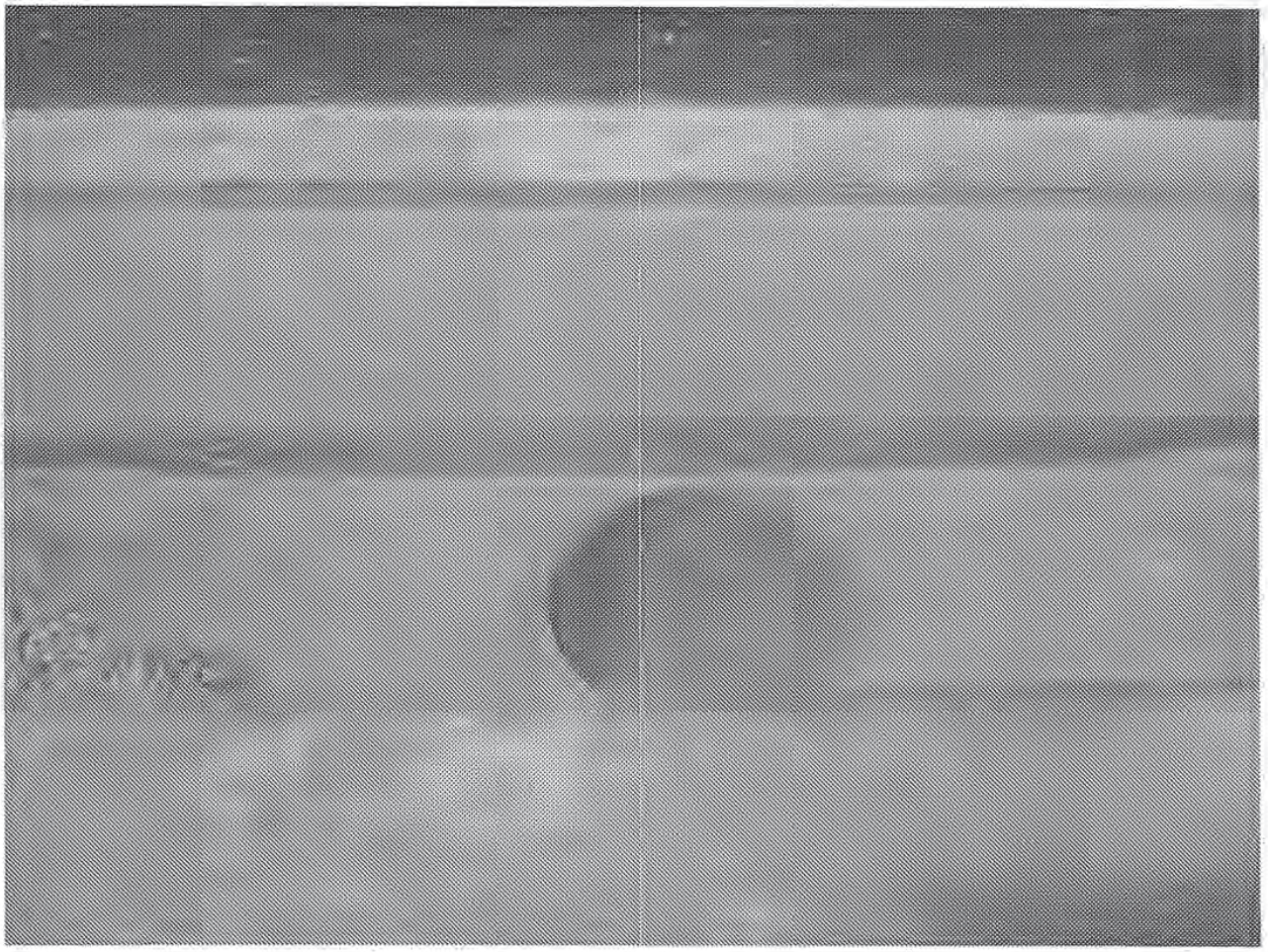
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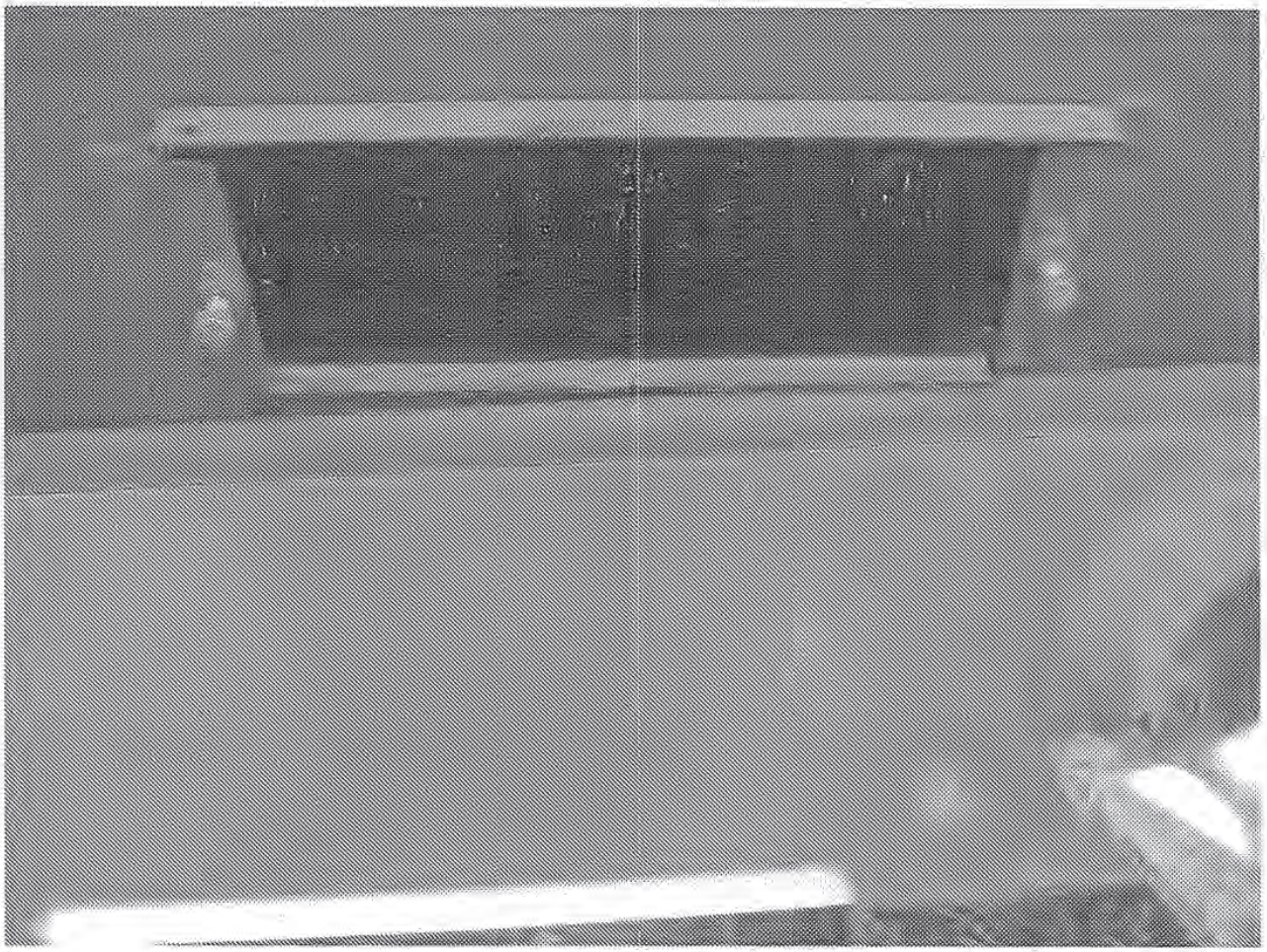
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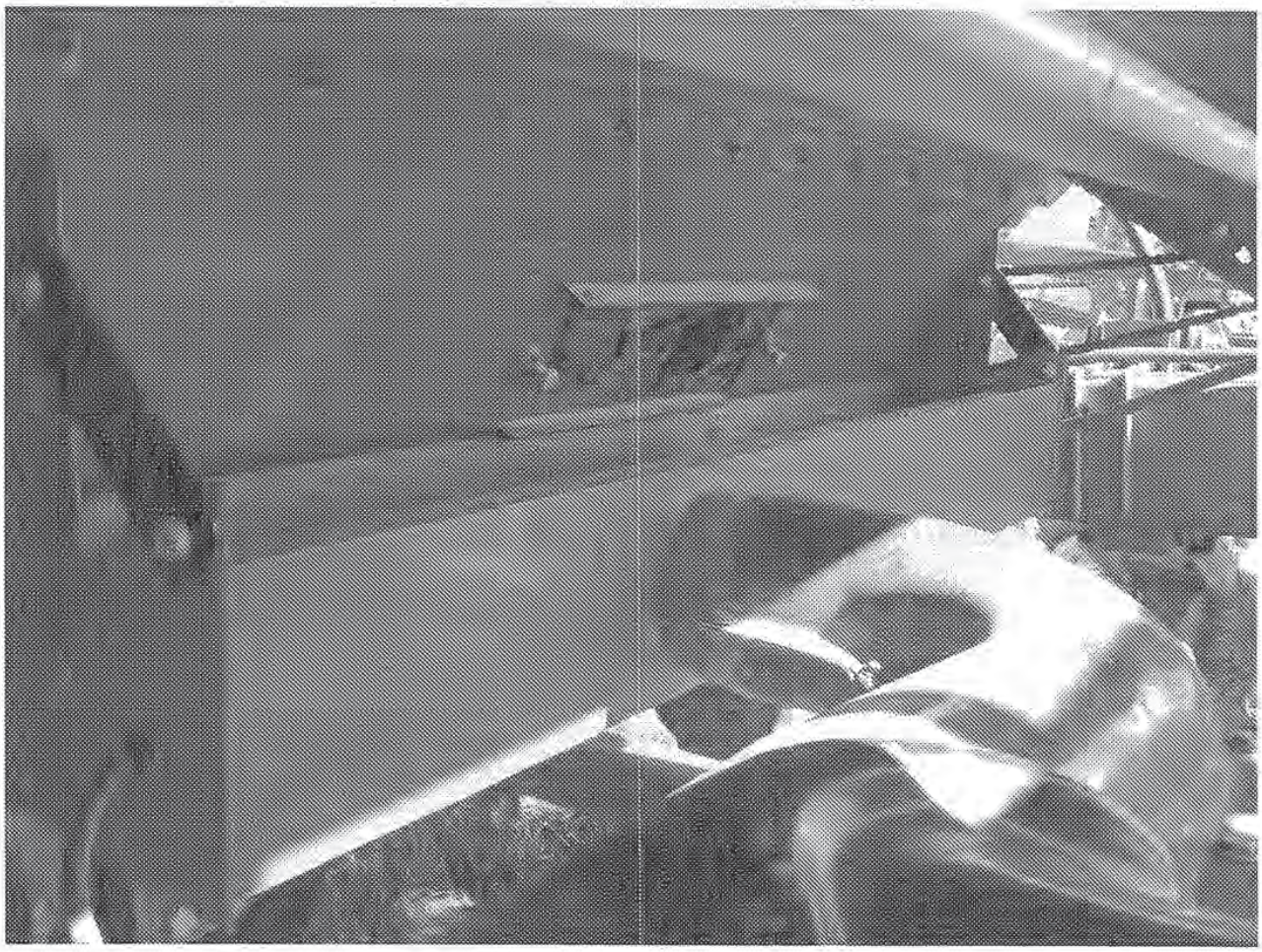
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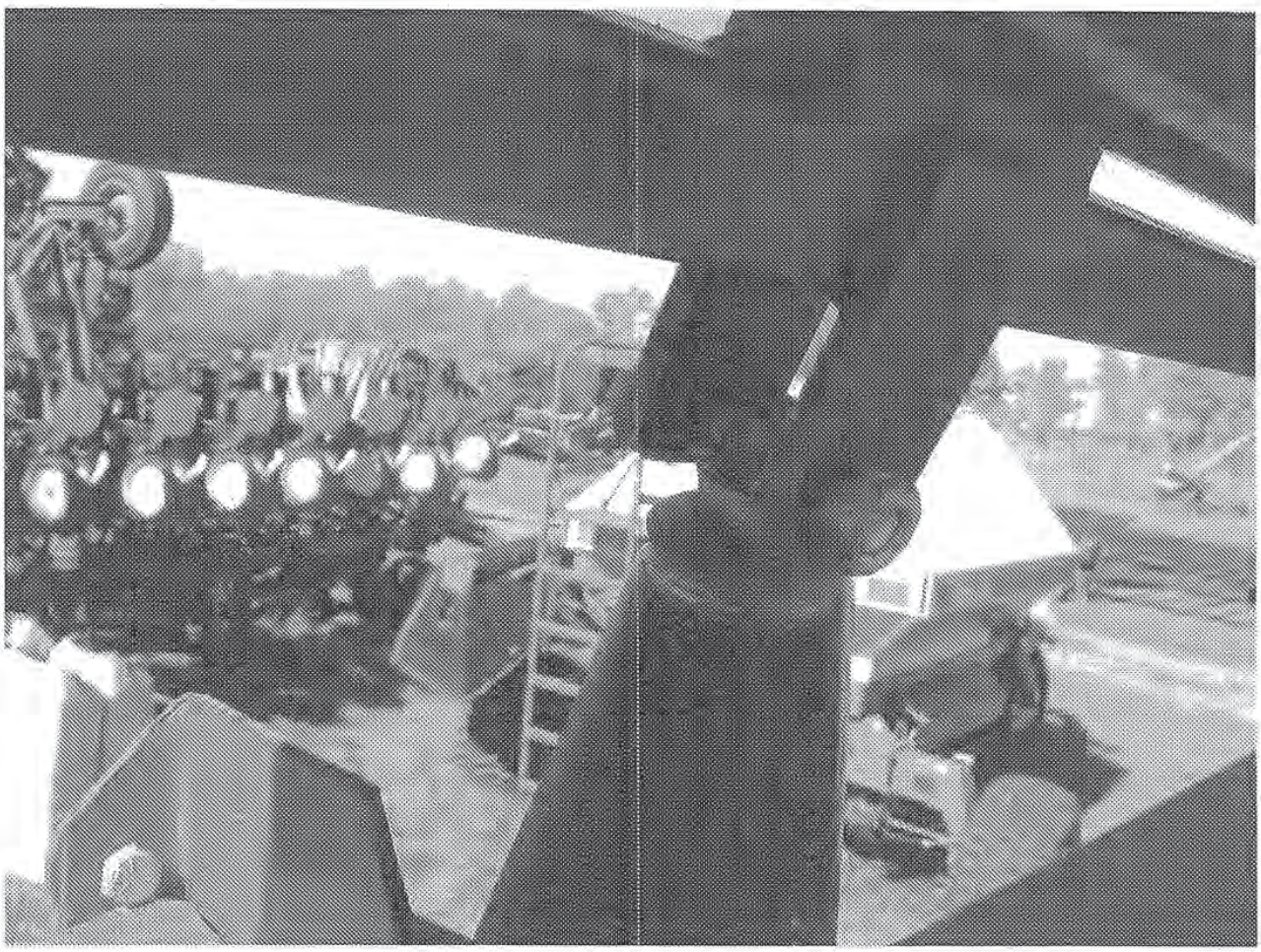
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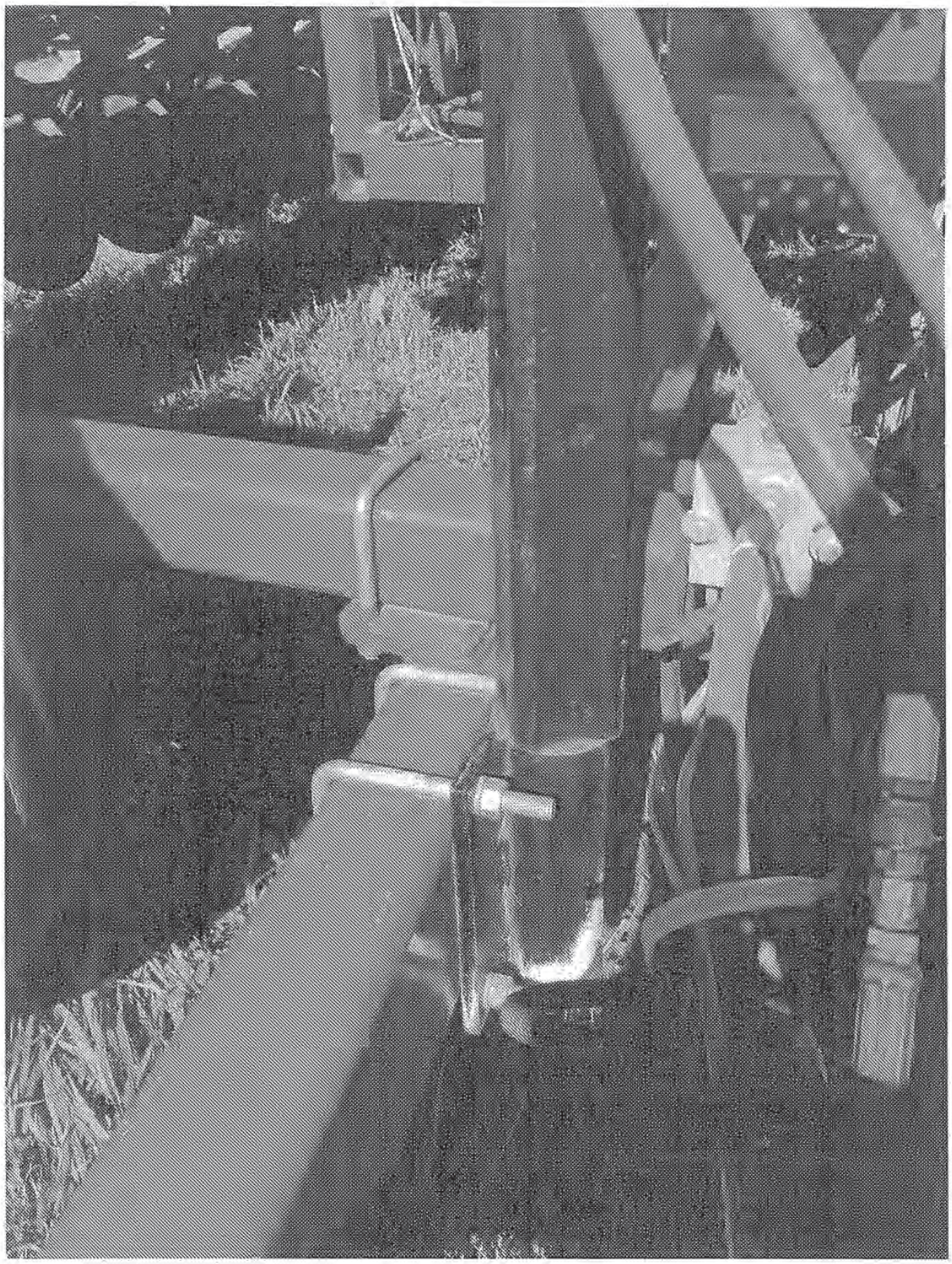
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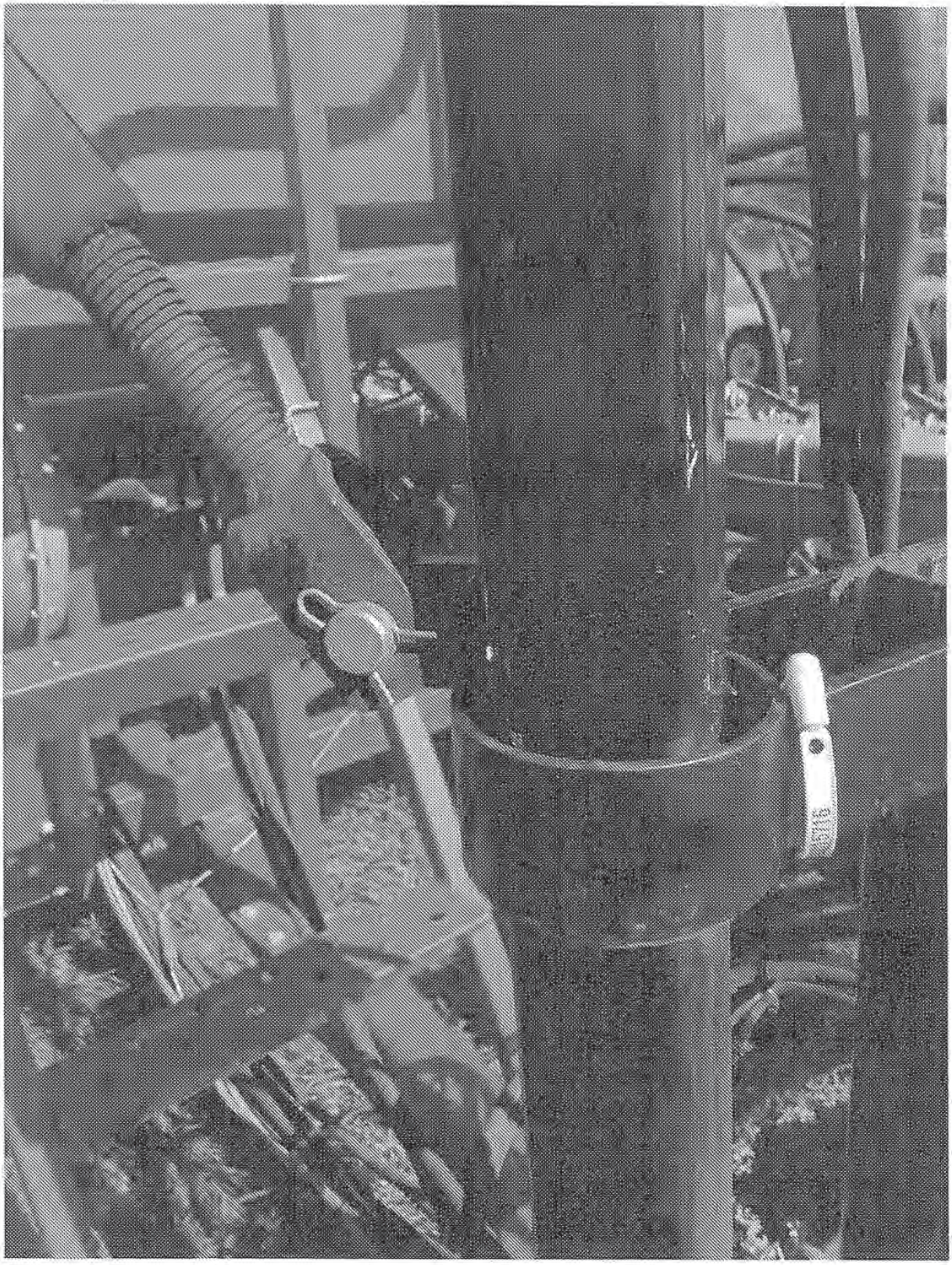
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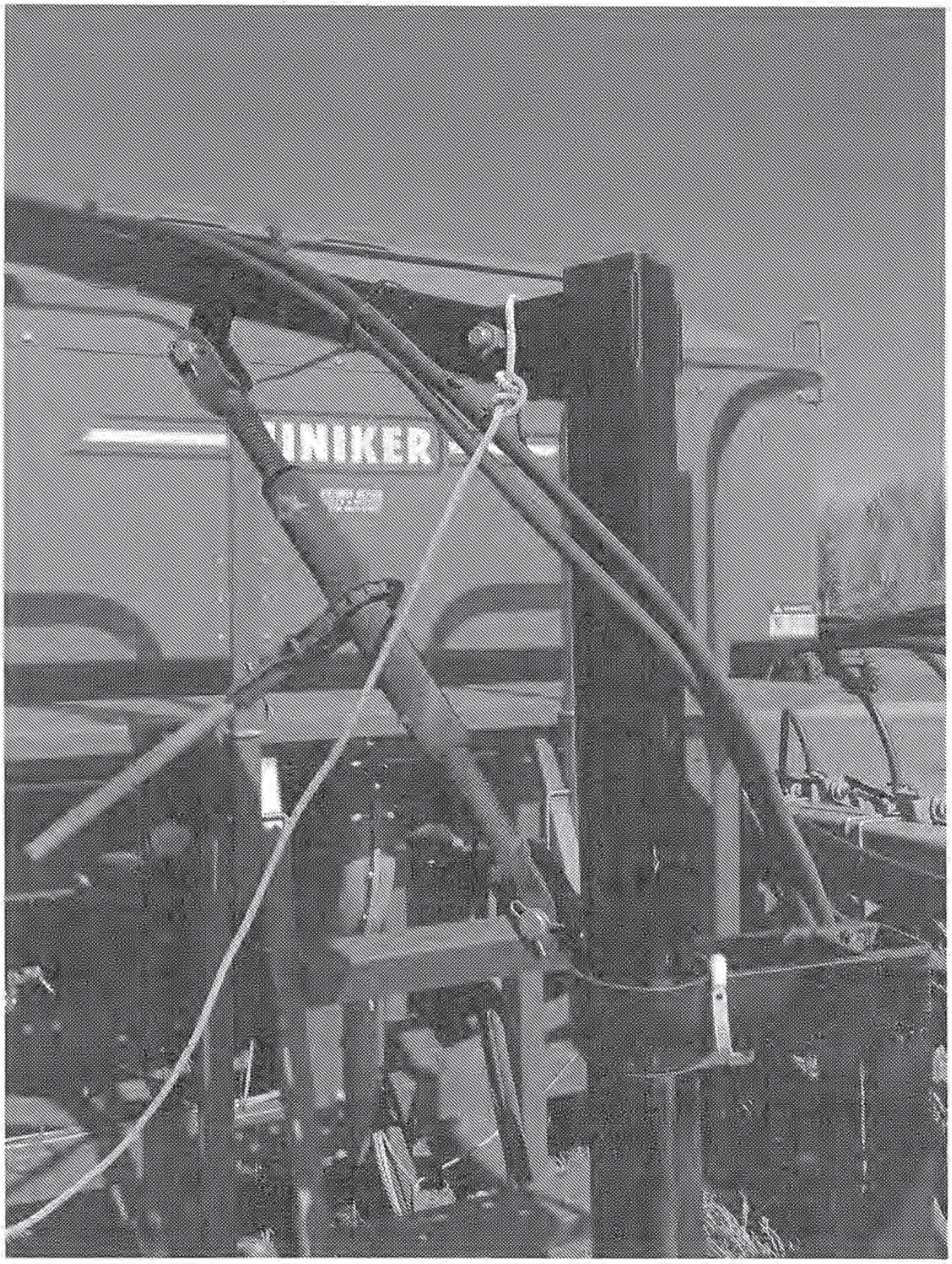
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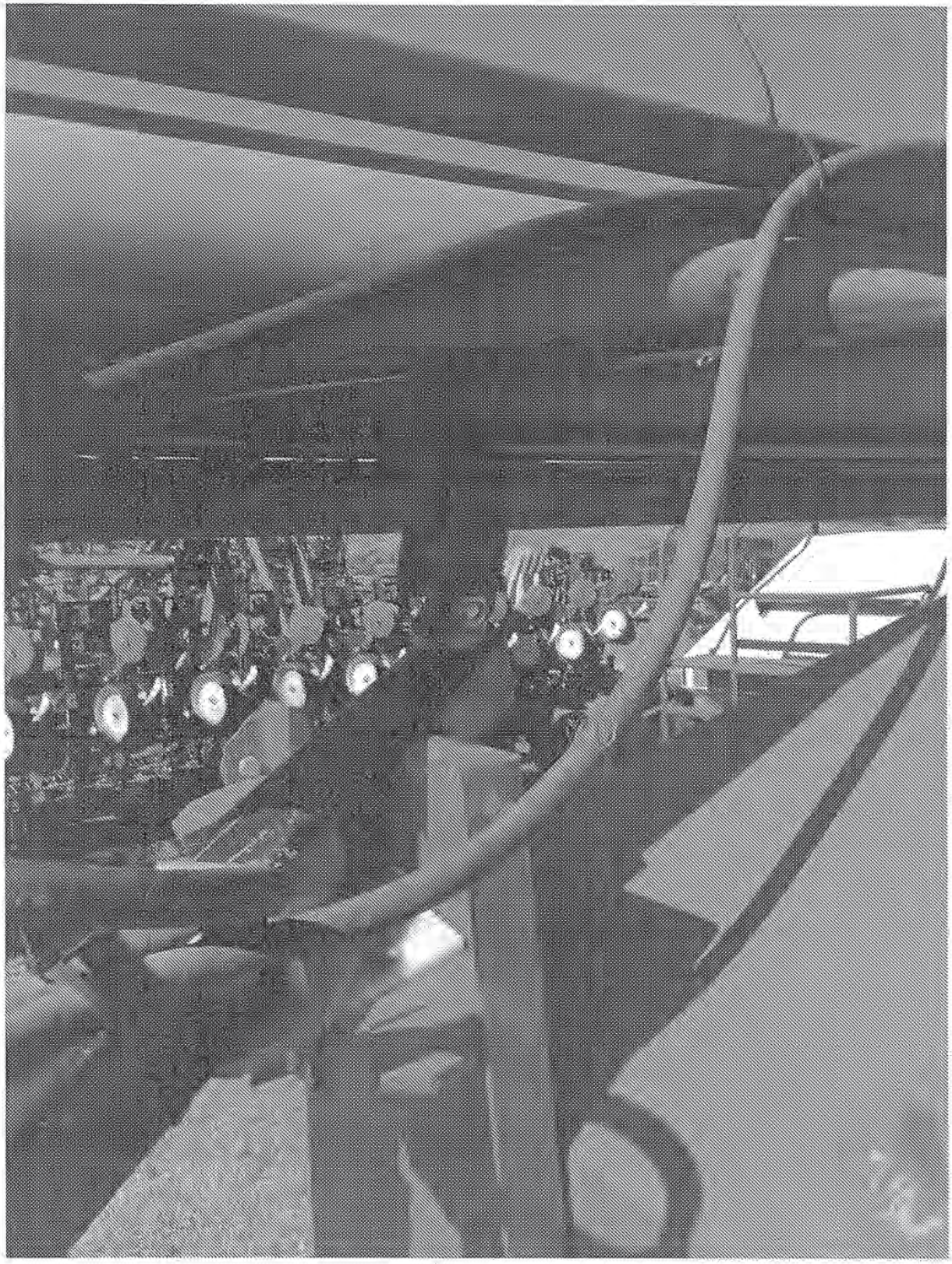
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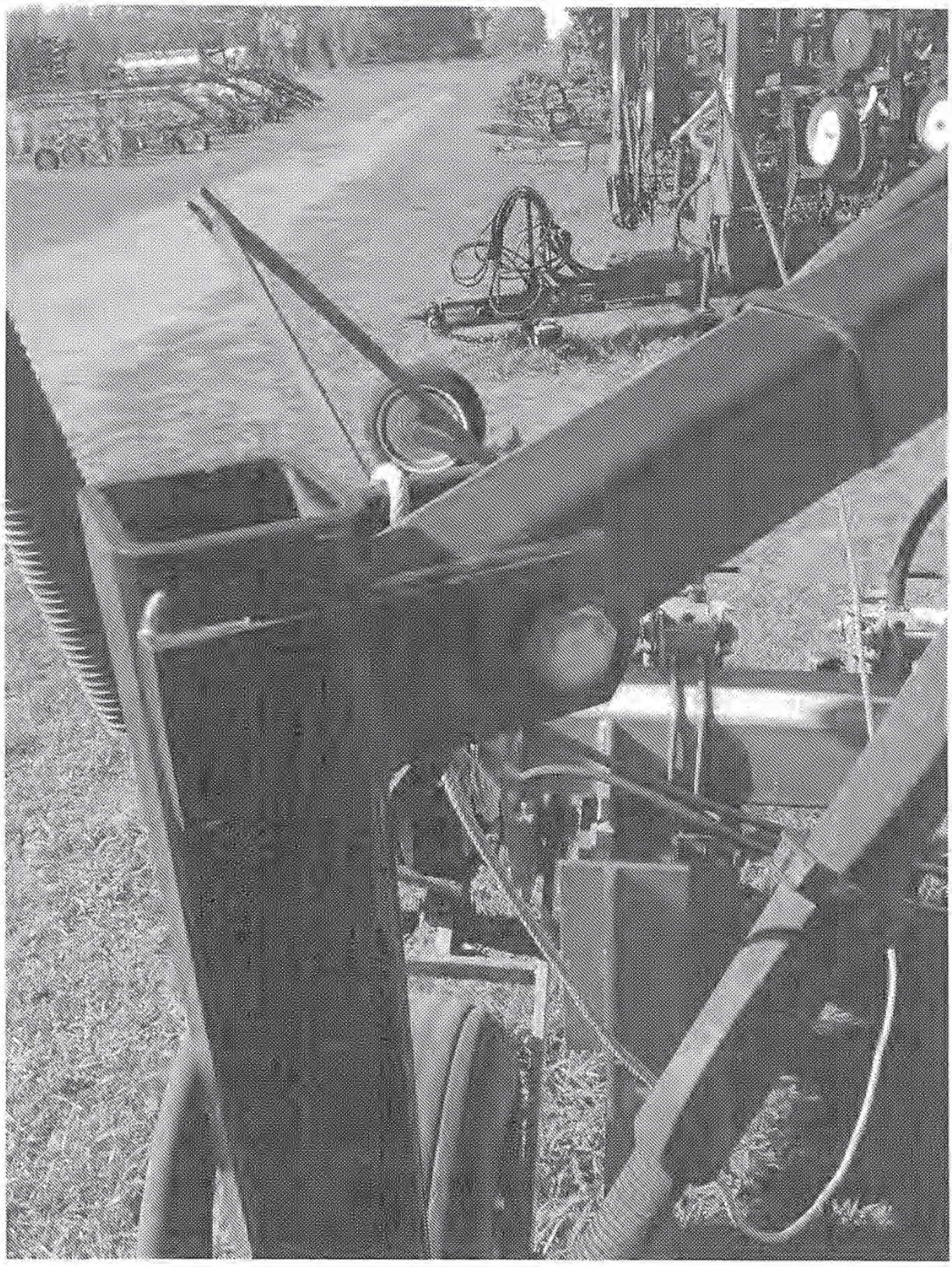
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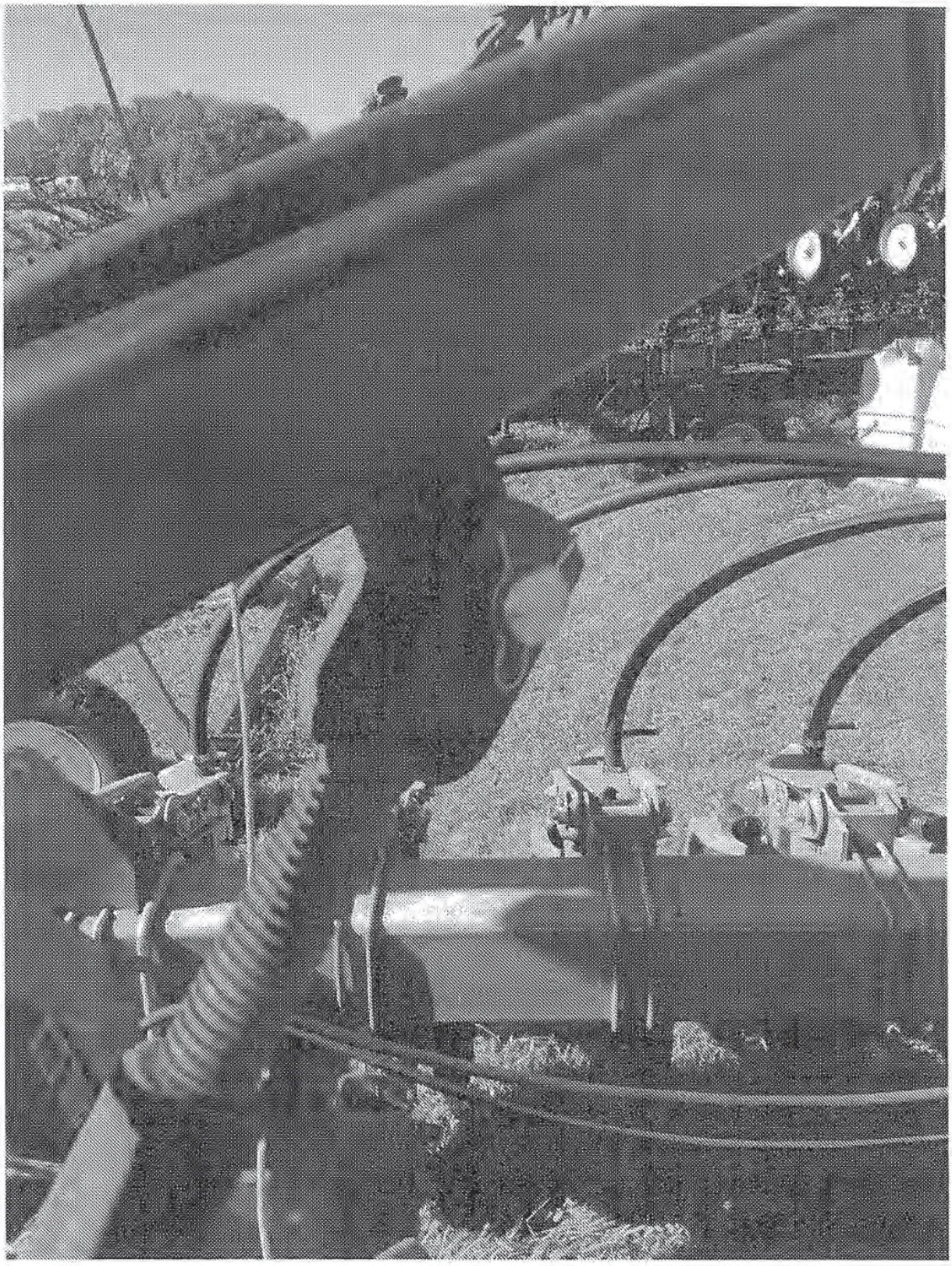
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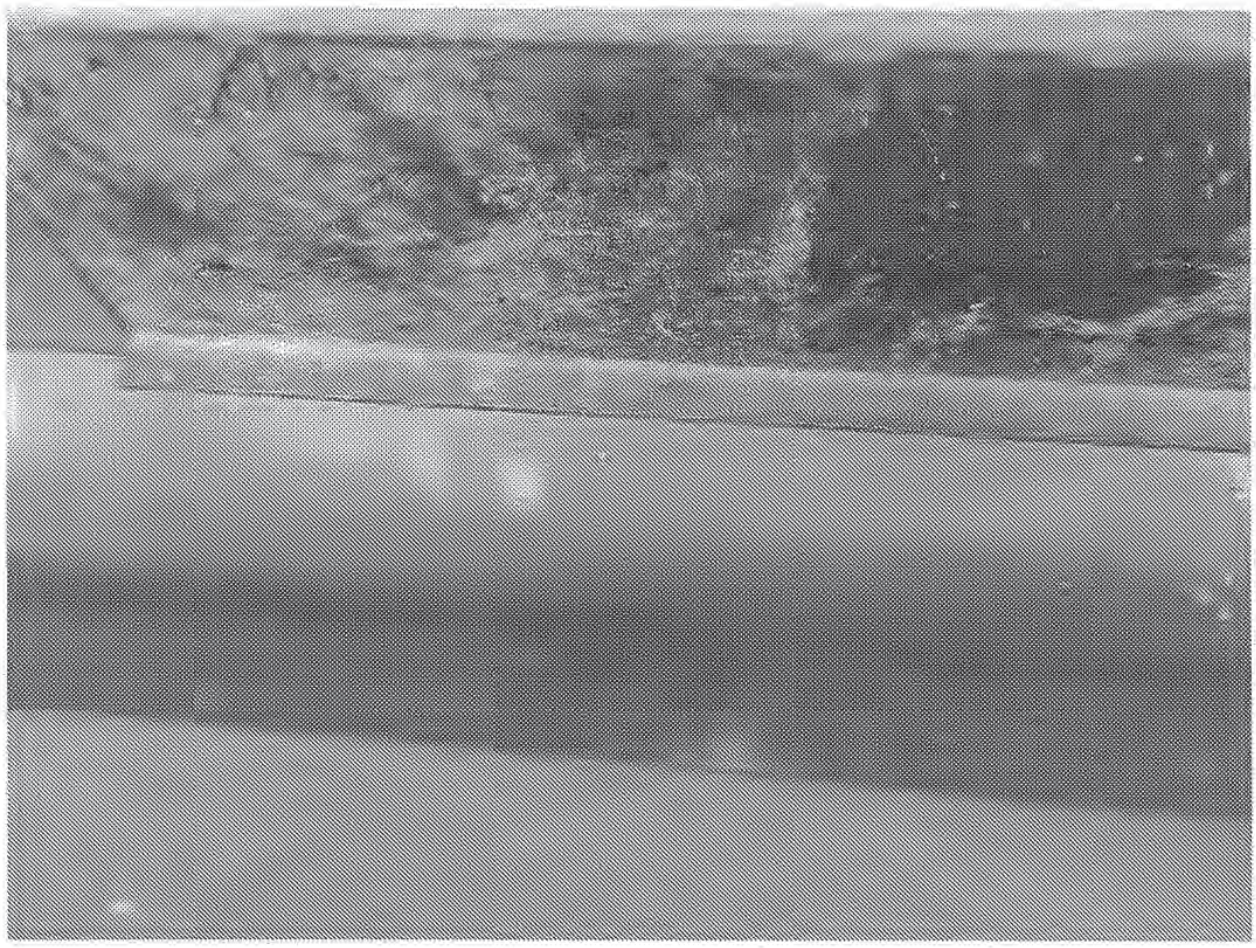
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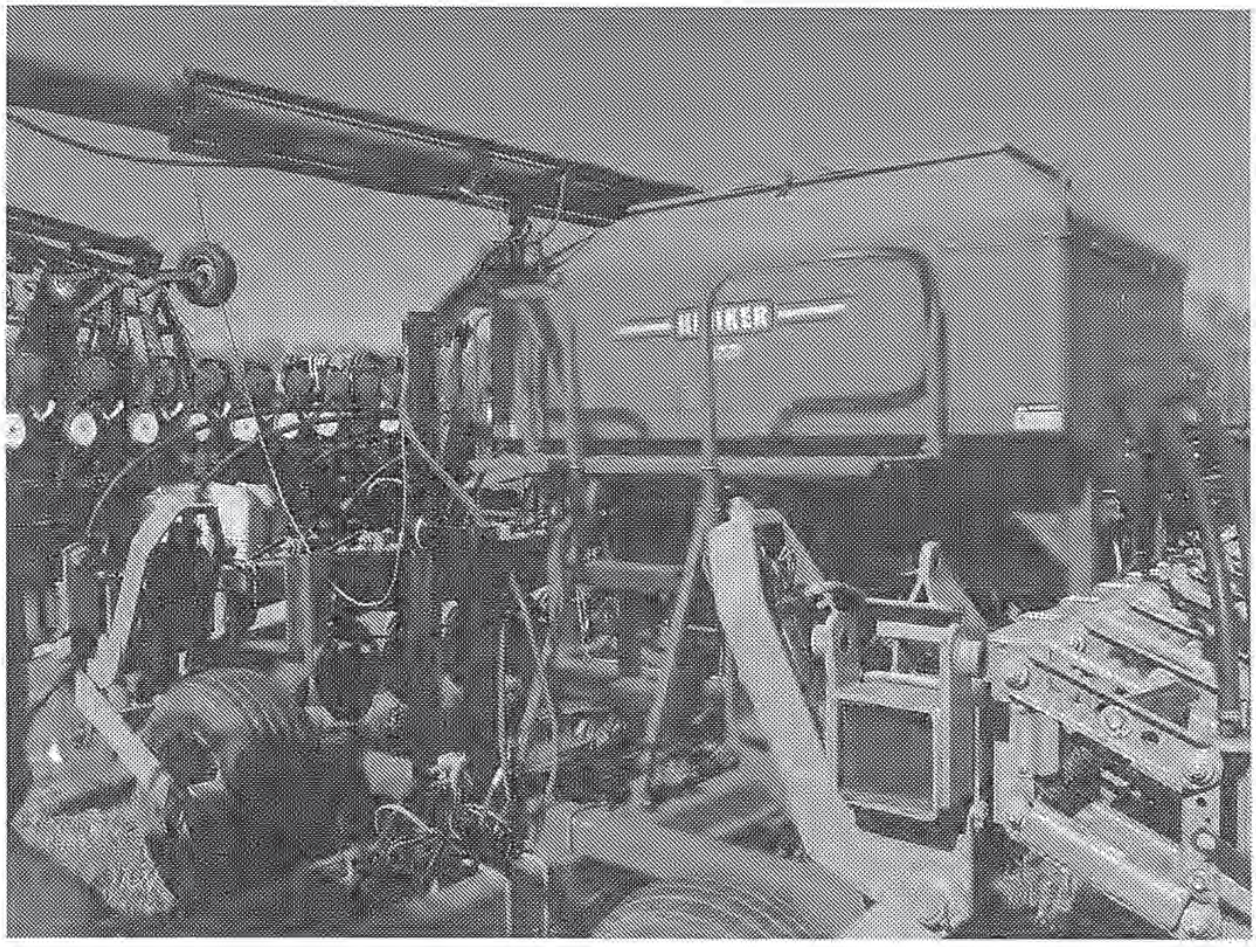
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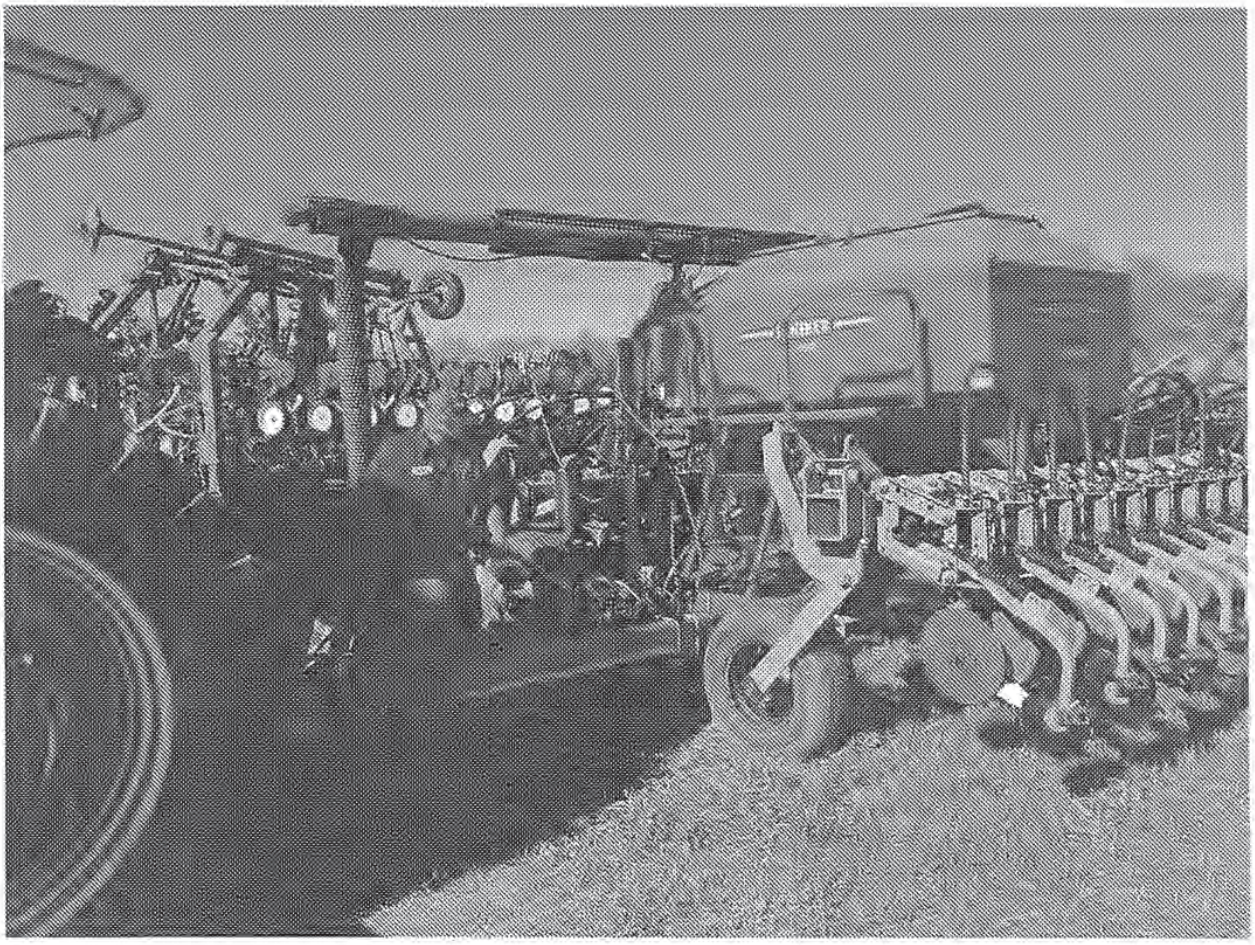
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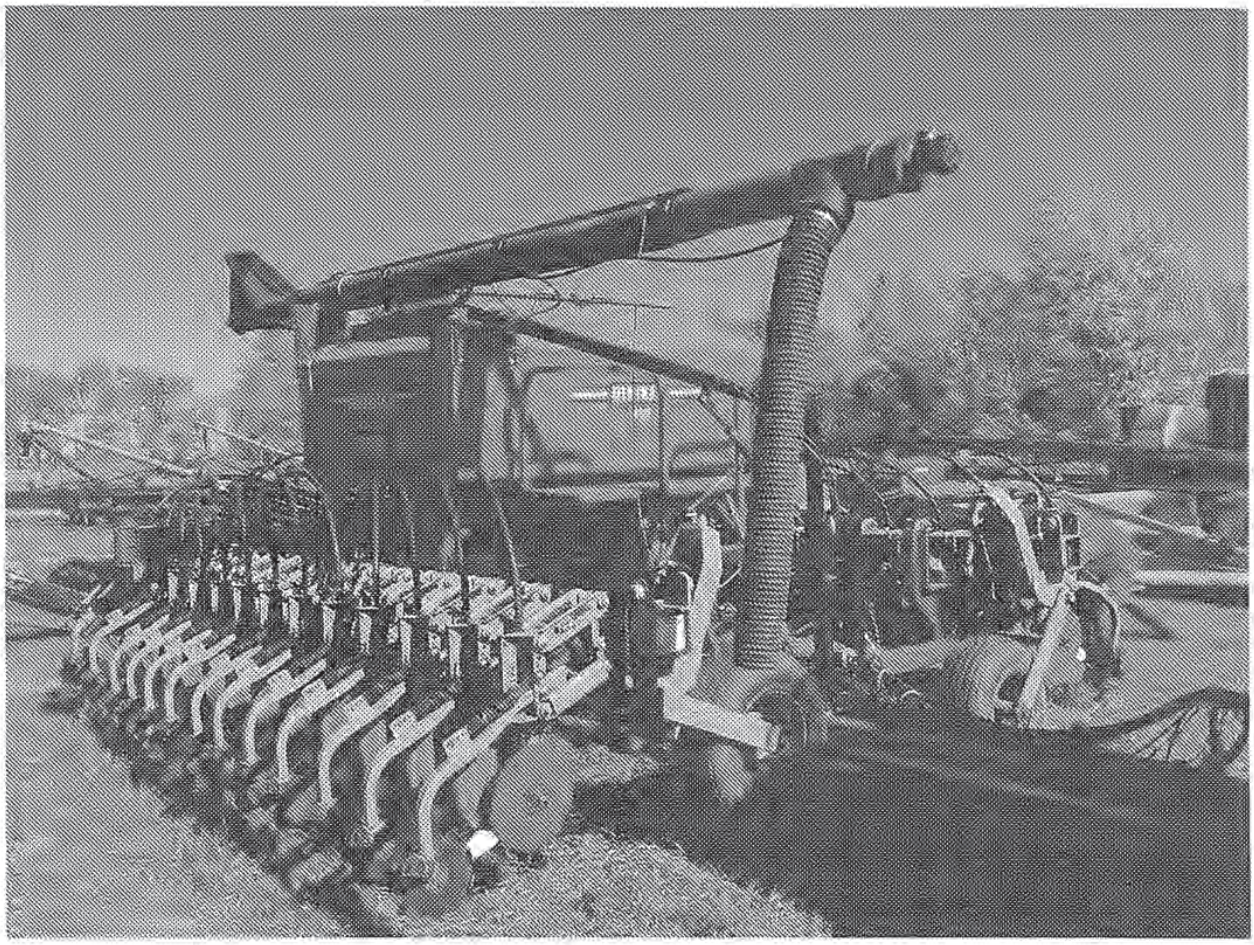
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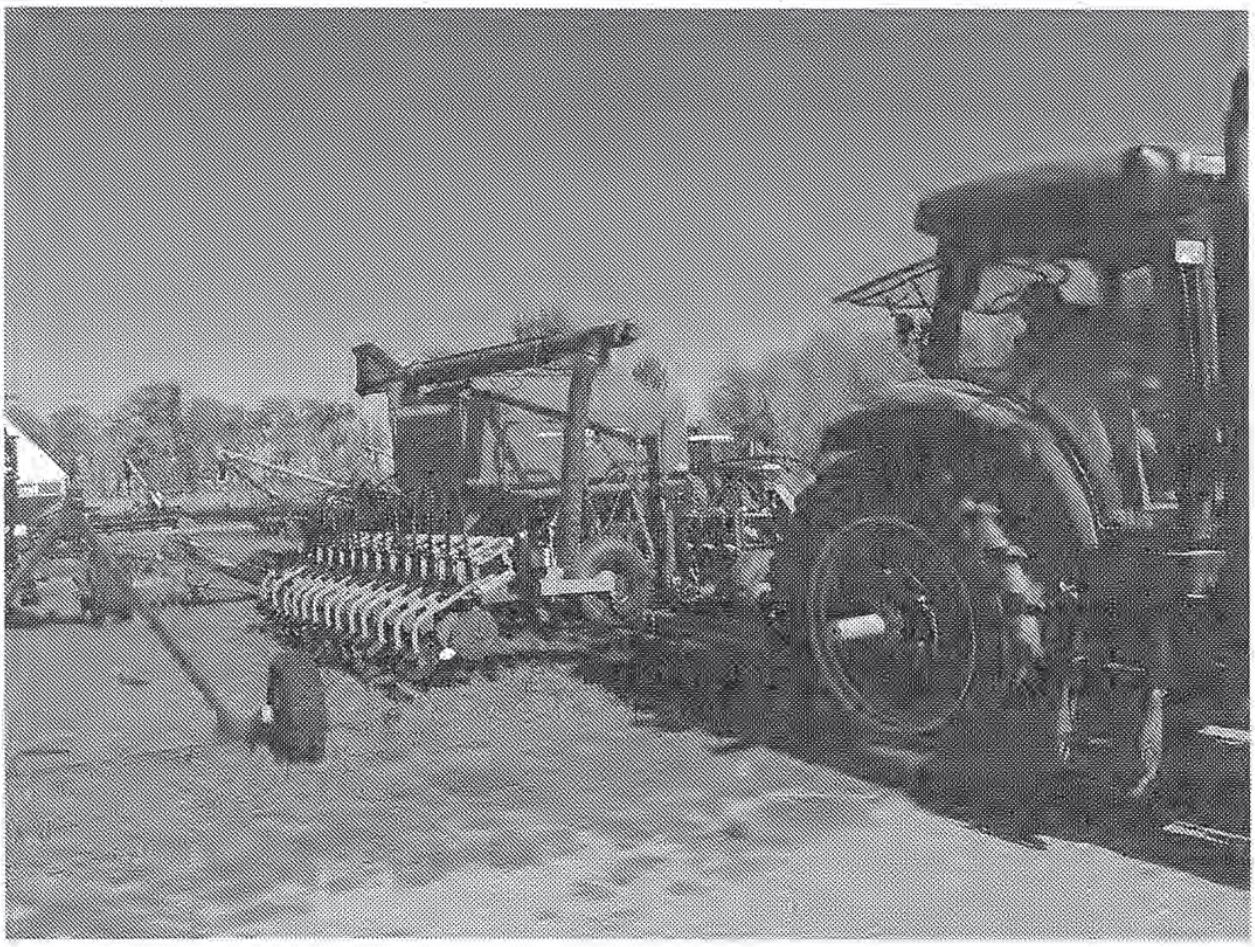
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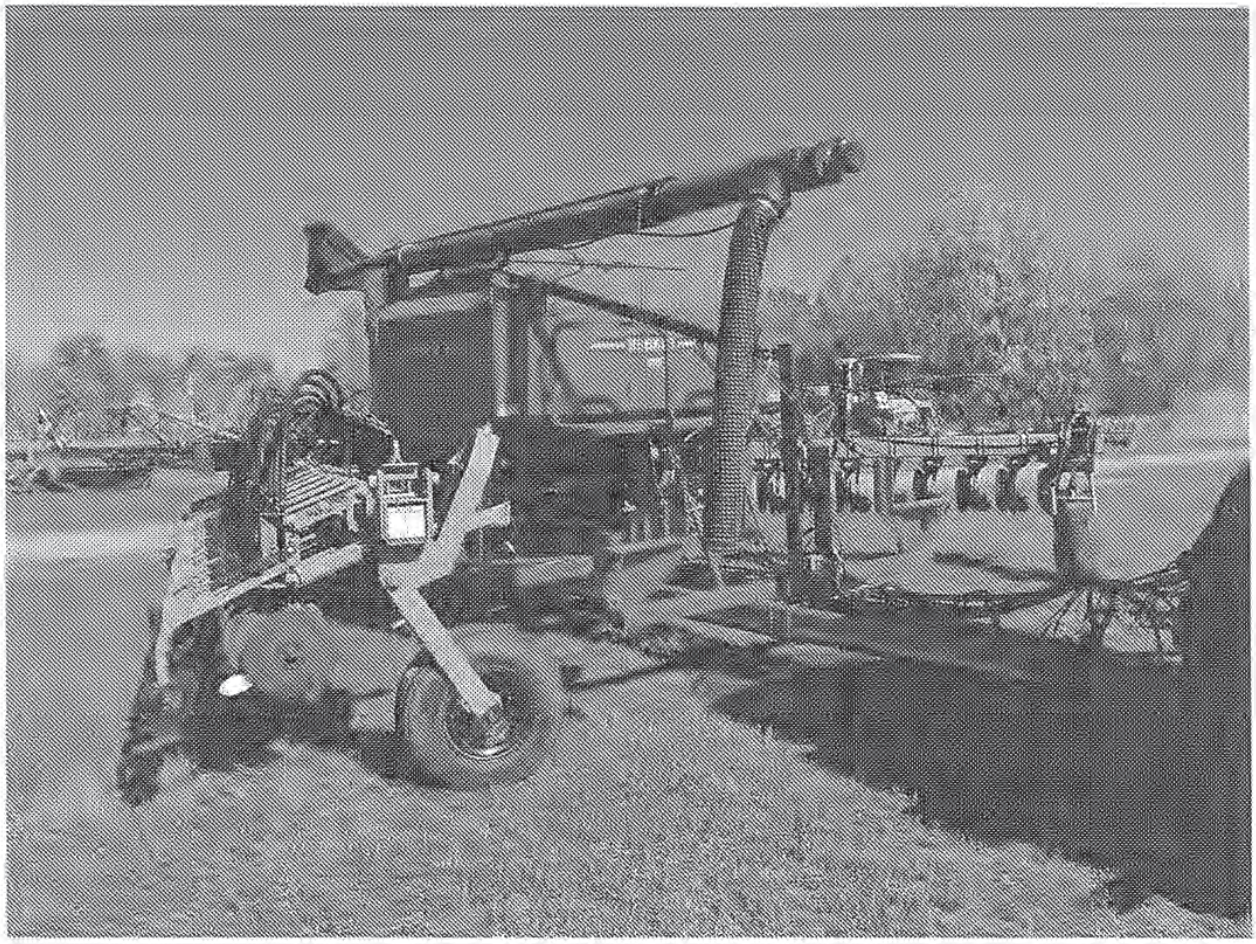
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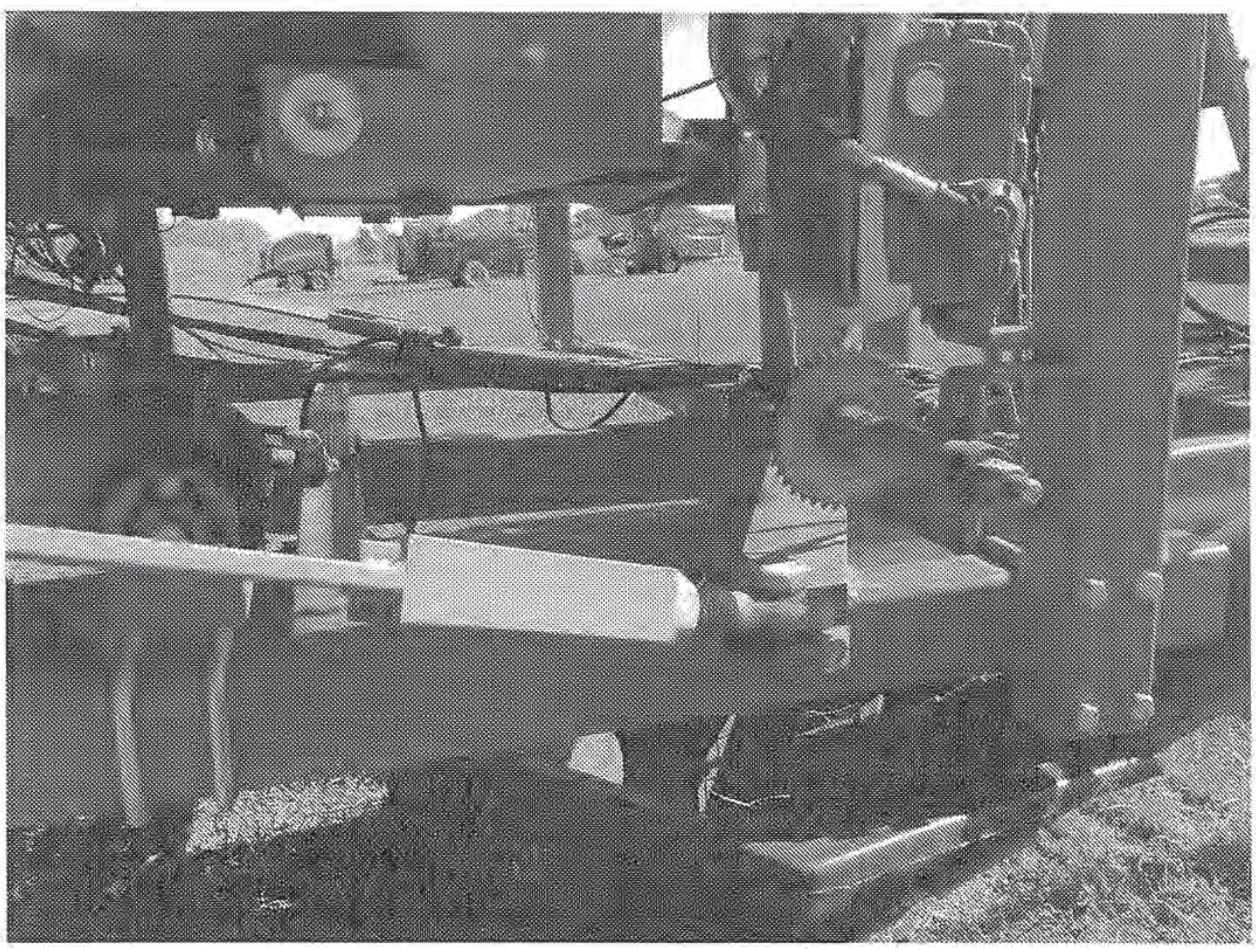
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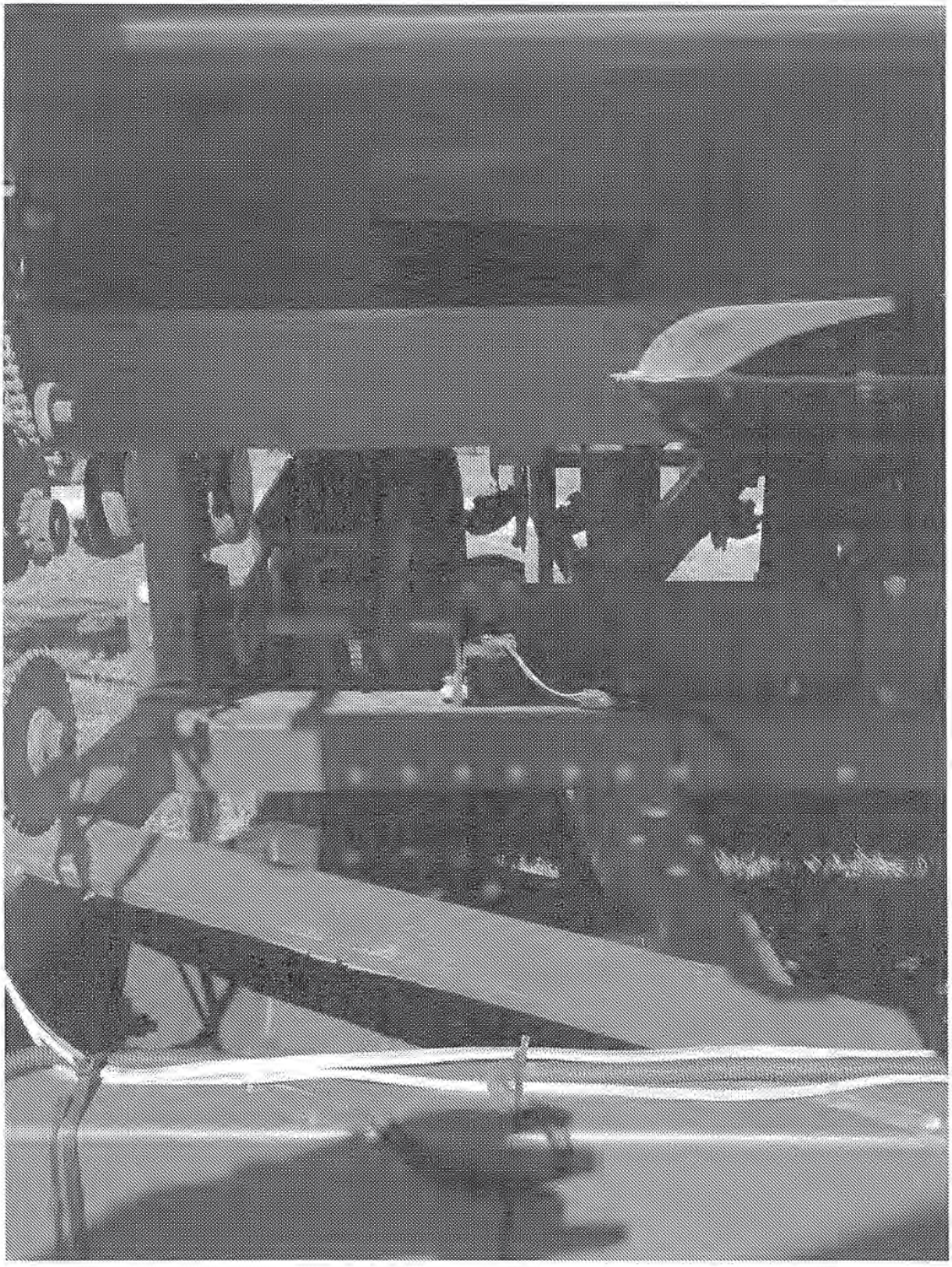
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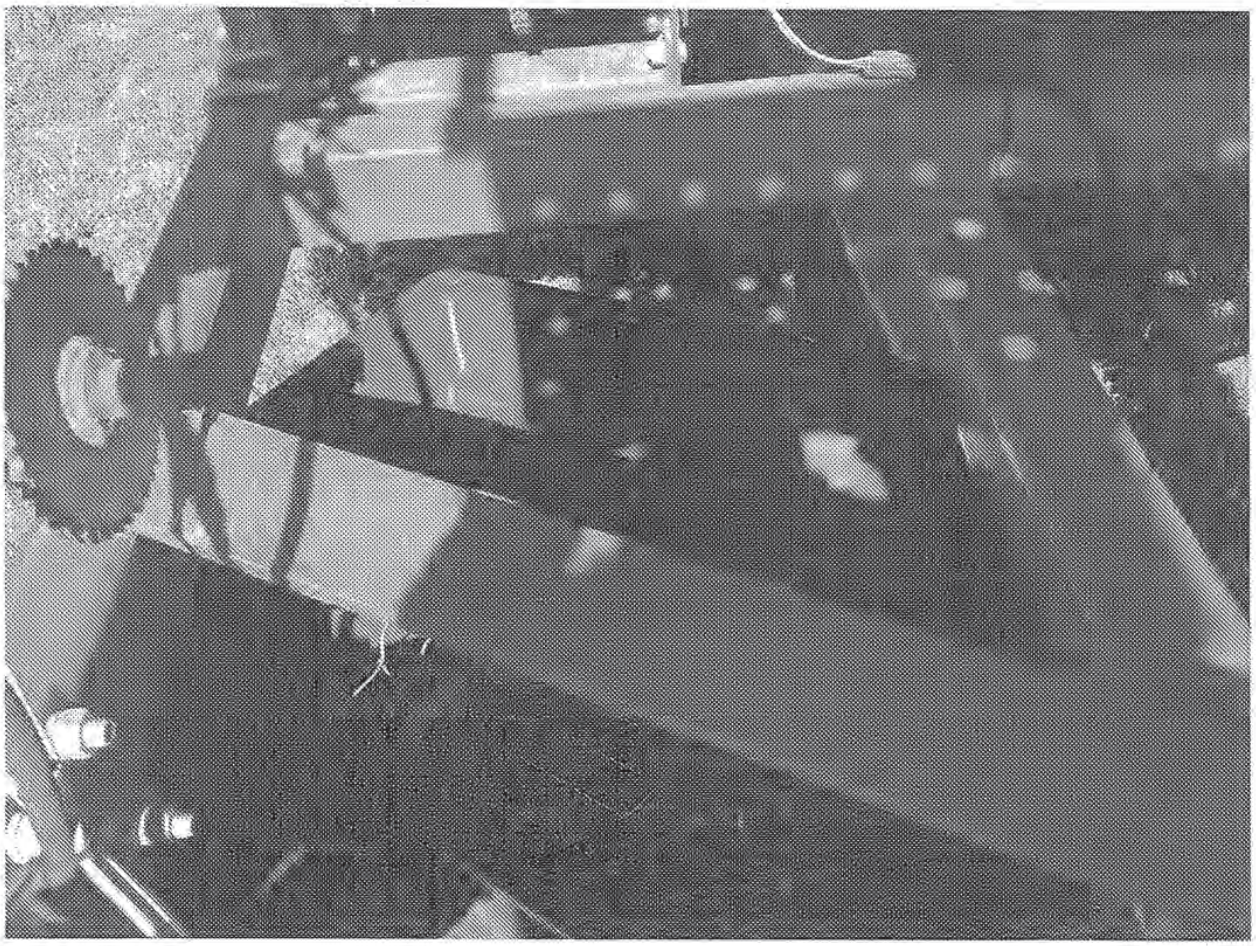
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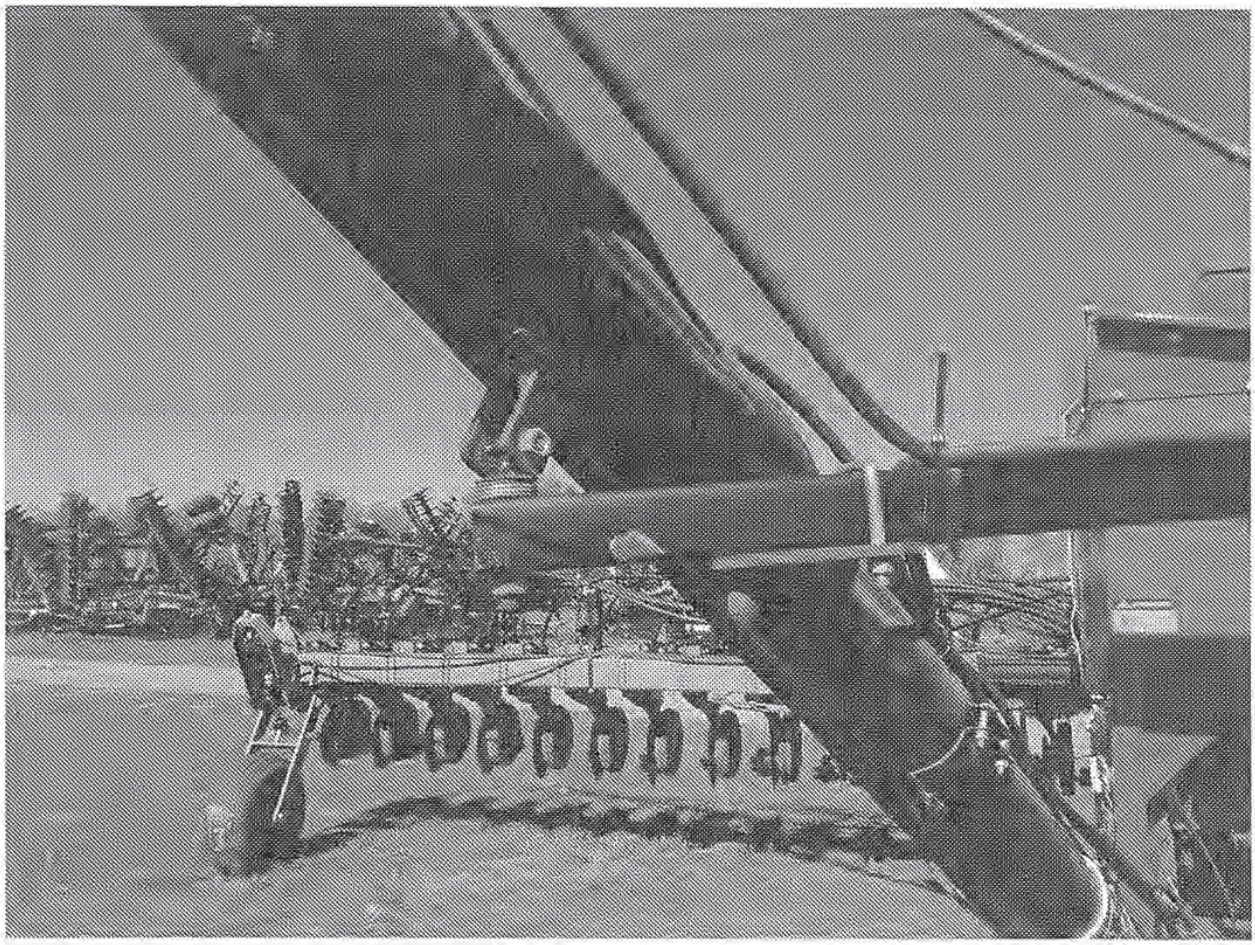
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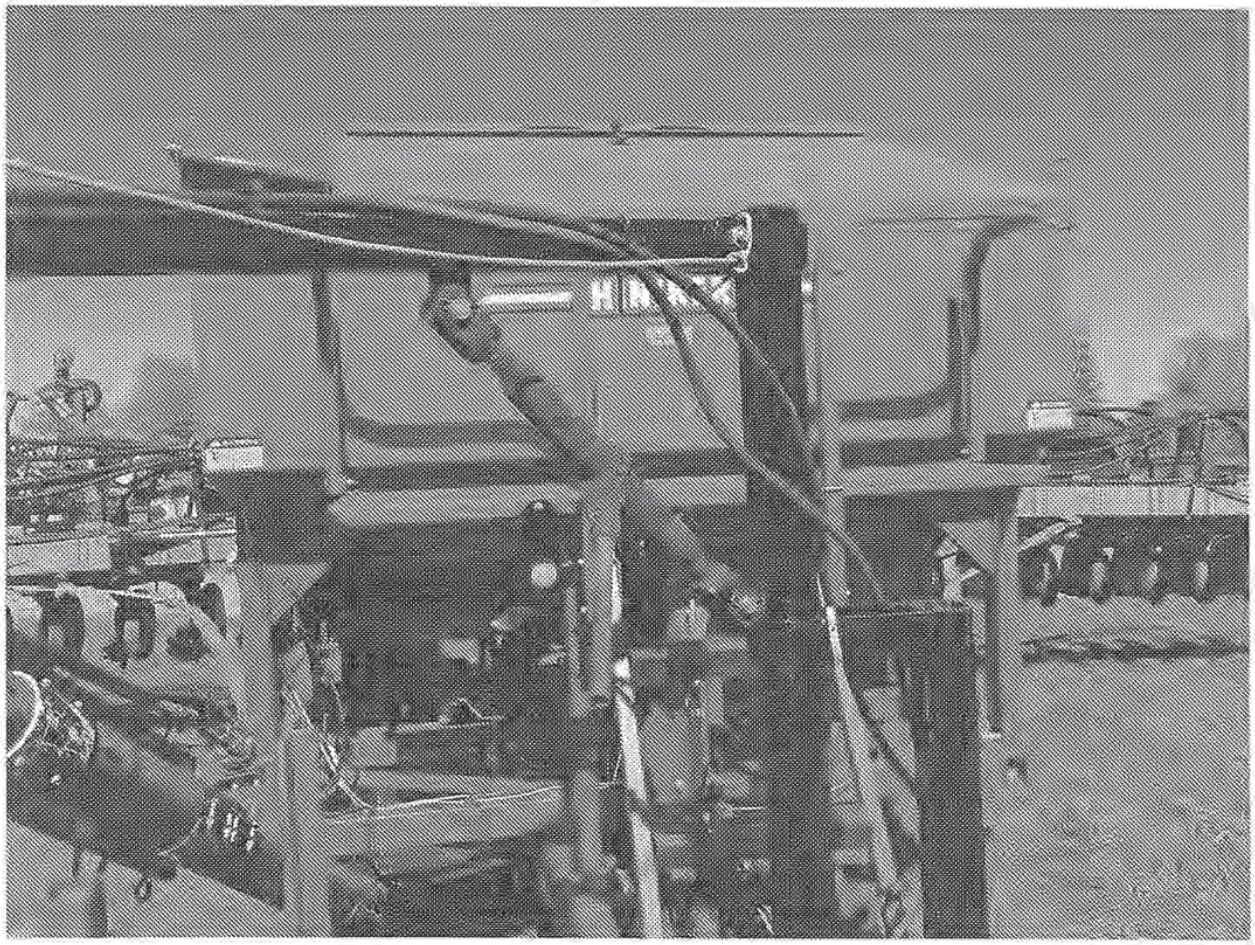
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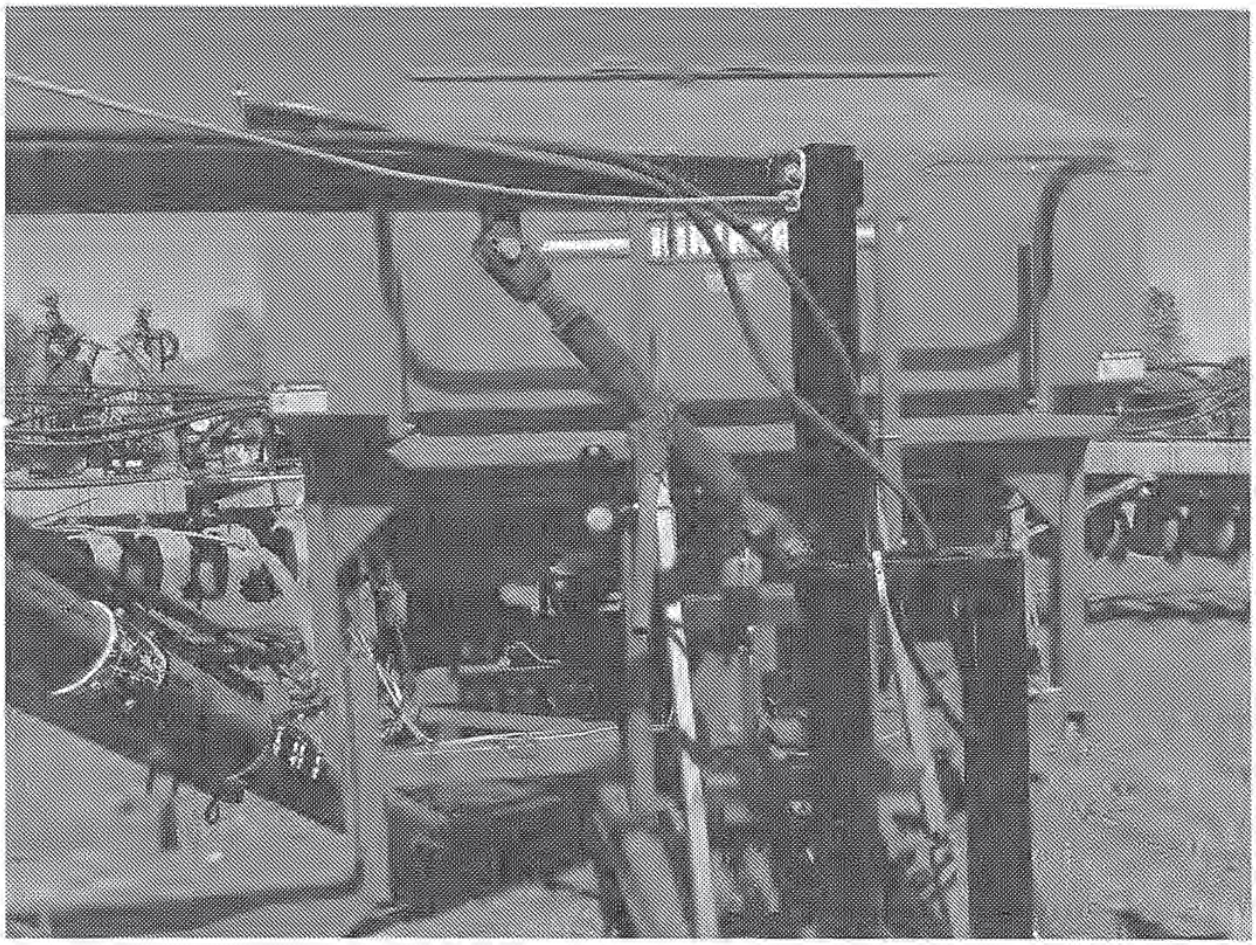
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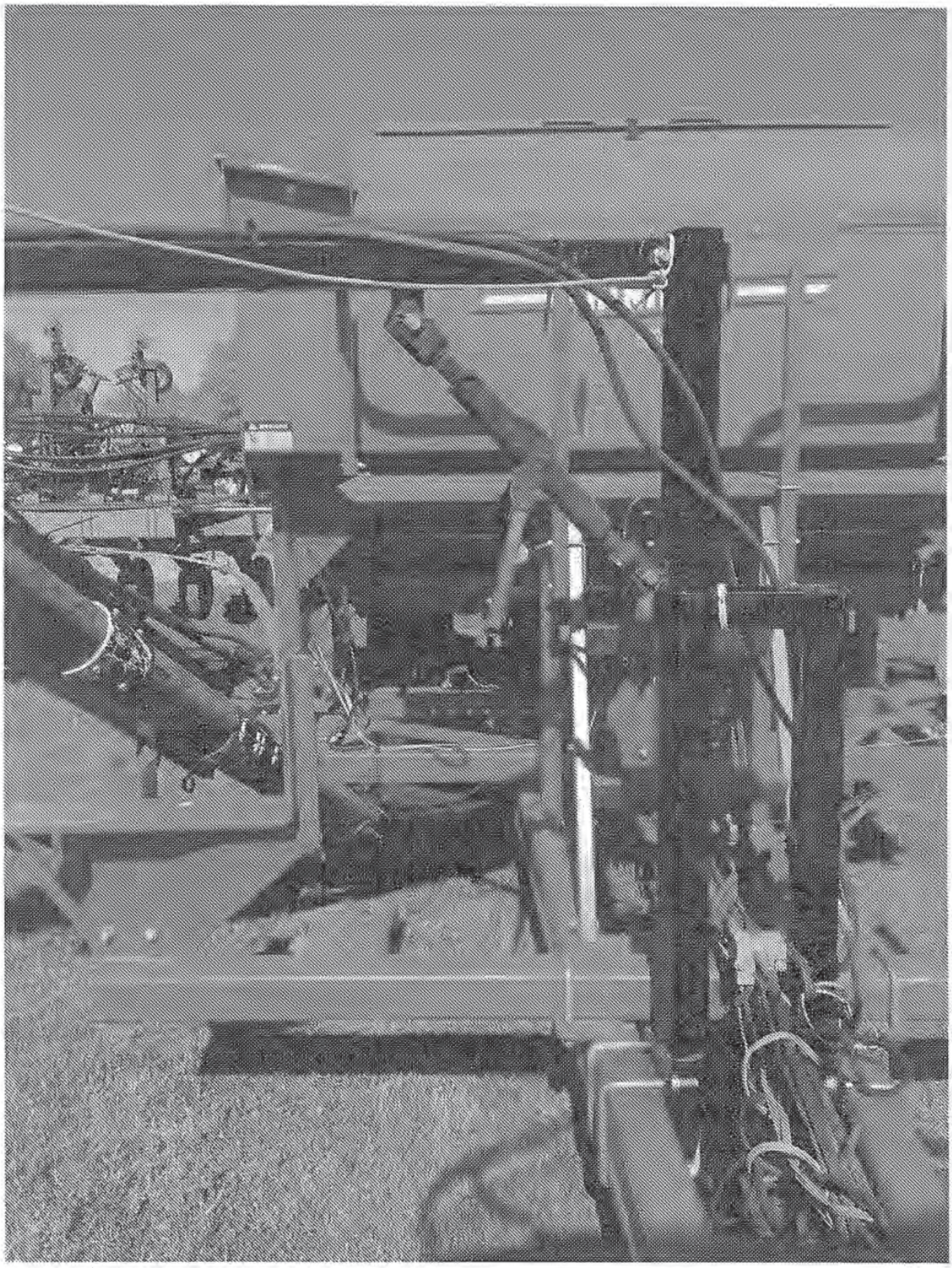
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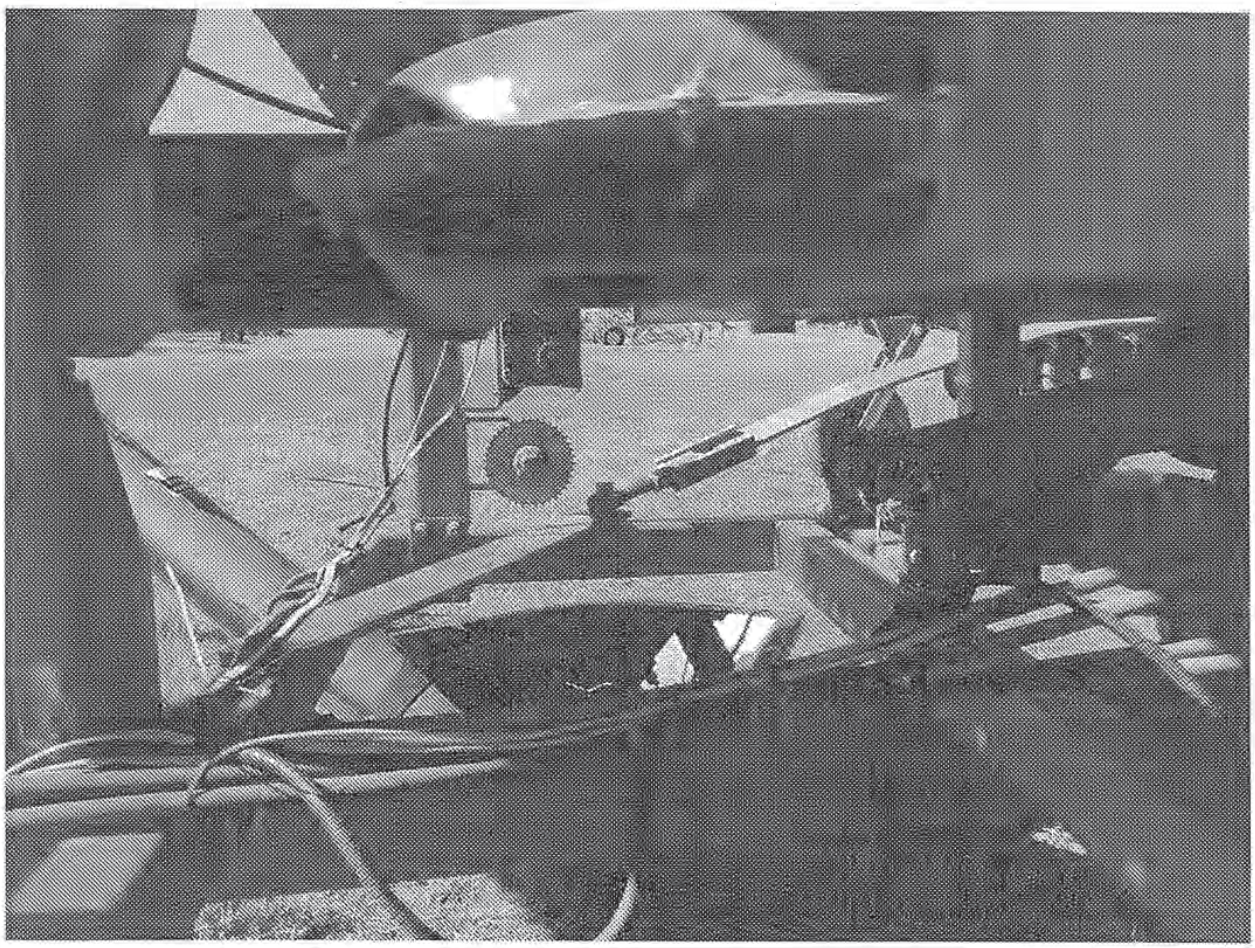
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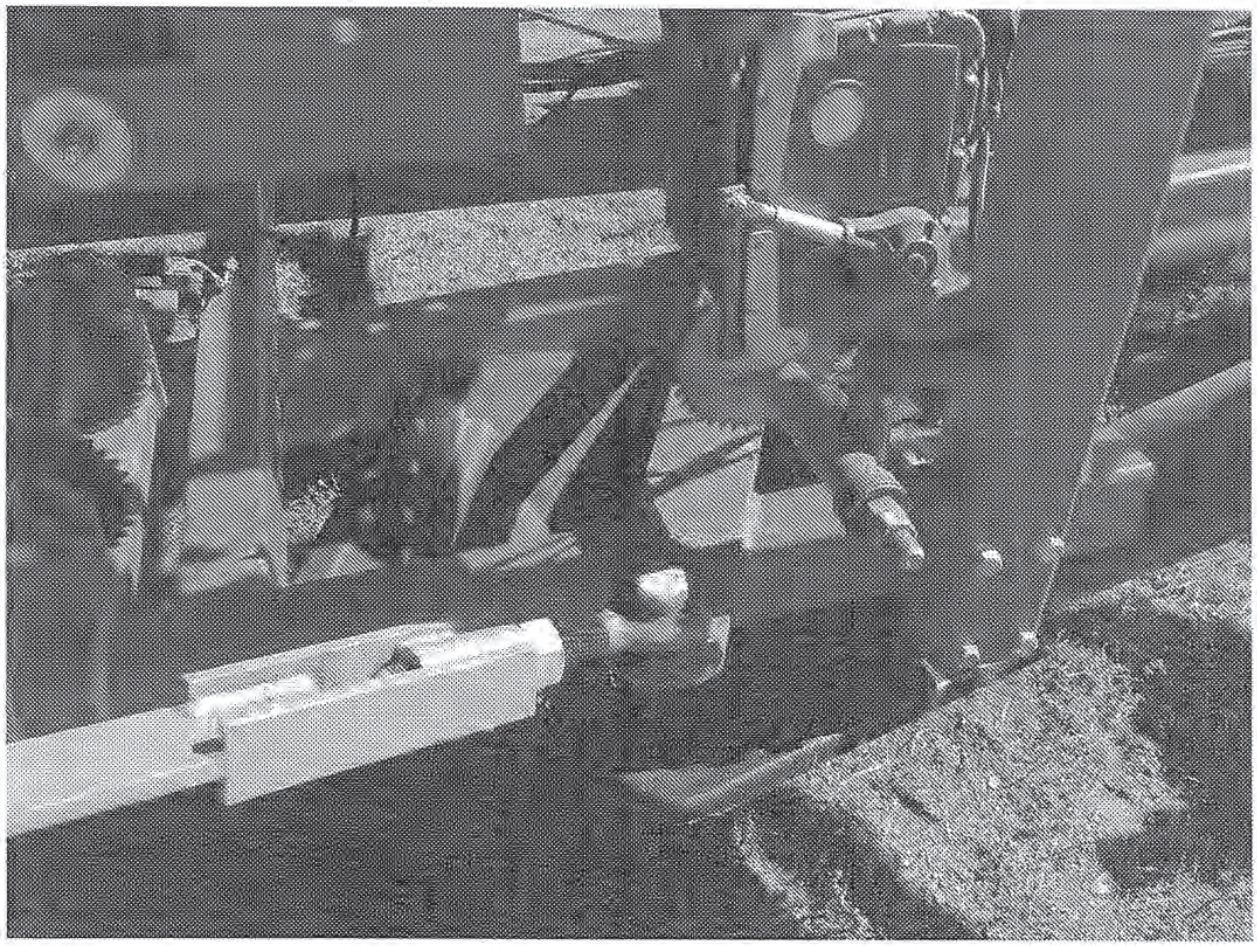
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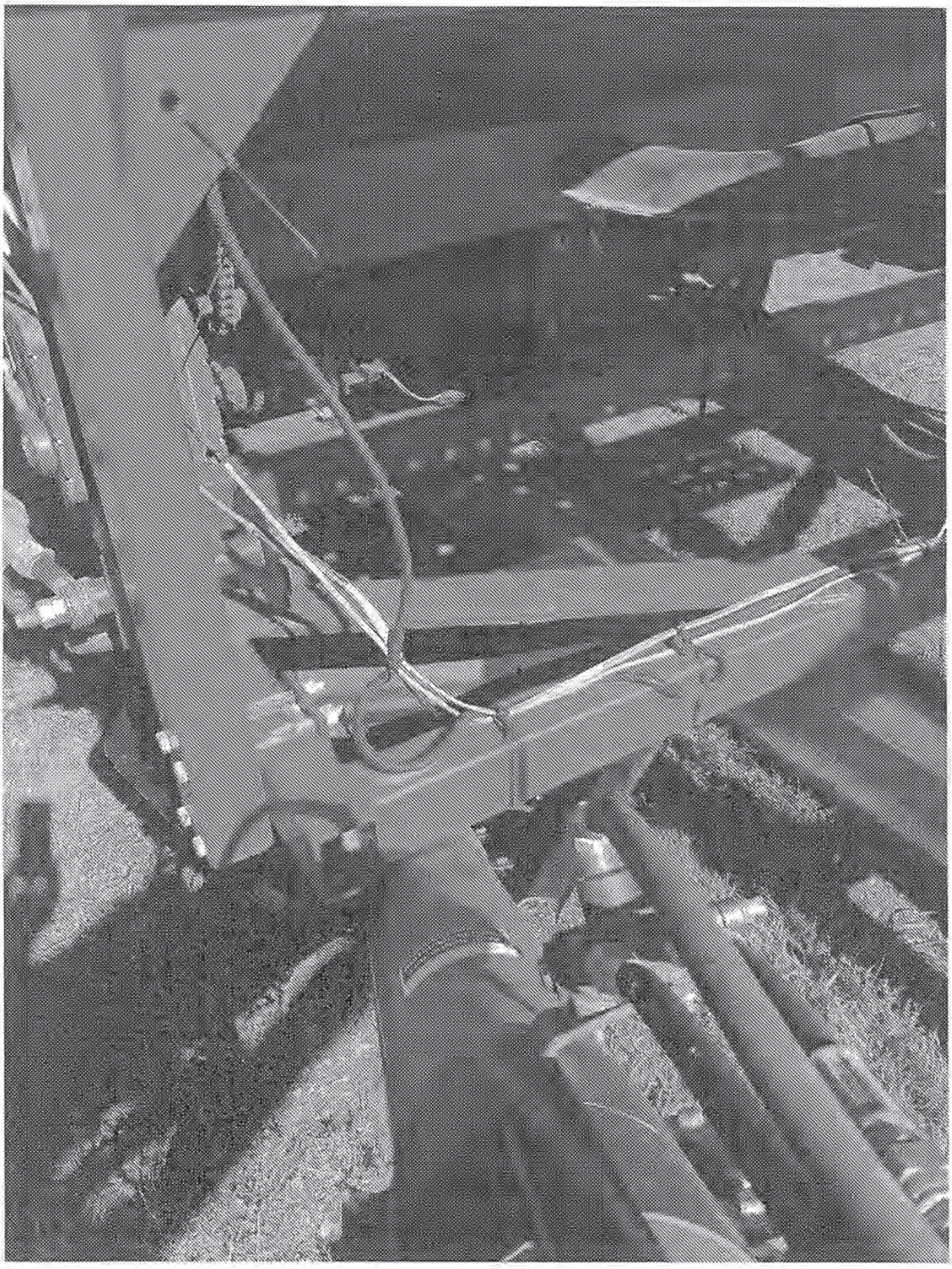
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JM-22-0000477



JM-22-0000478



JM-22-0000479



JM-22-0000480



JM-22-0000481



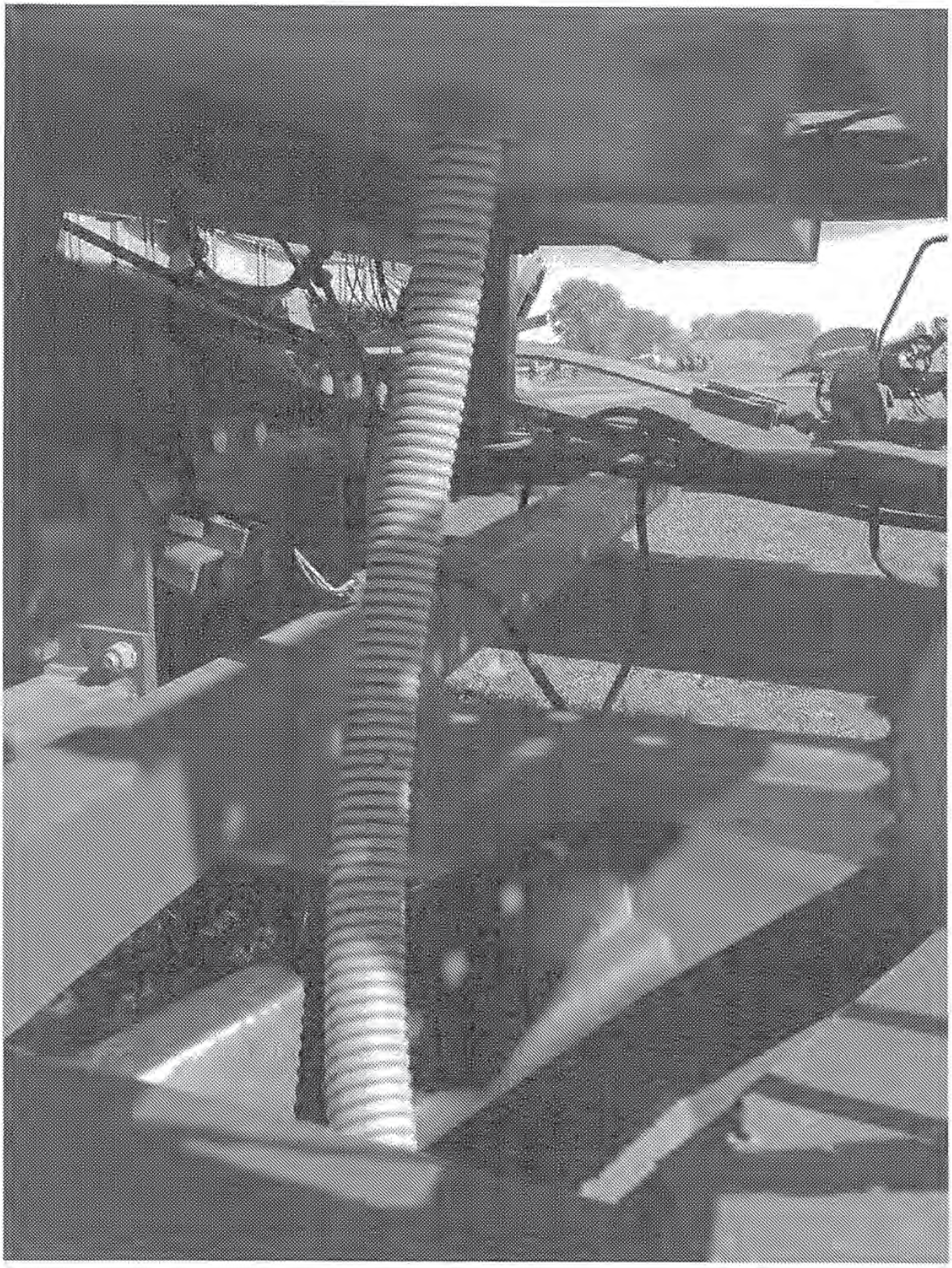
JM-22-0000482



JM-22-0000483



JM-22-0000484



JM-22-0000485



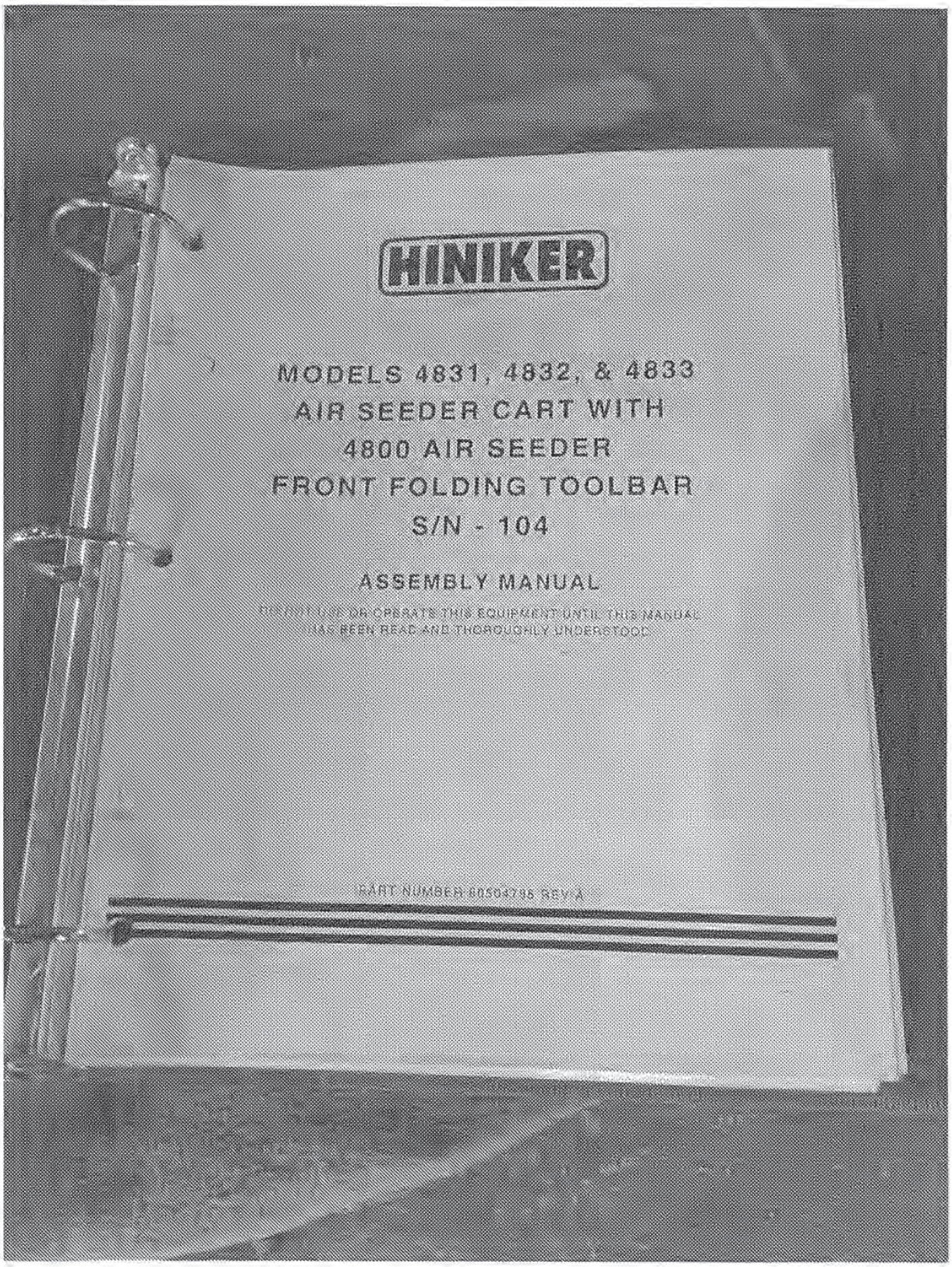
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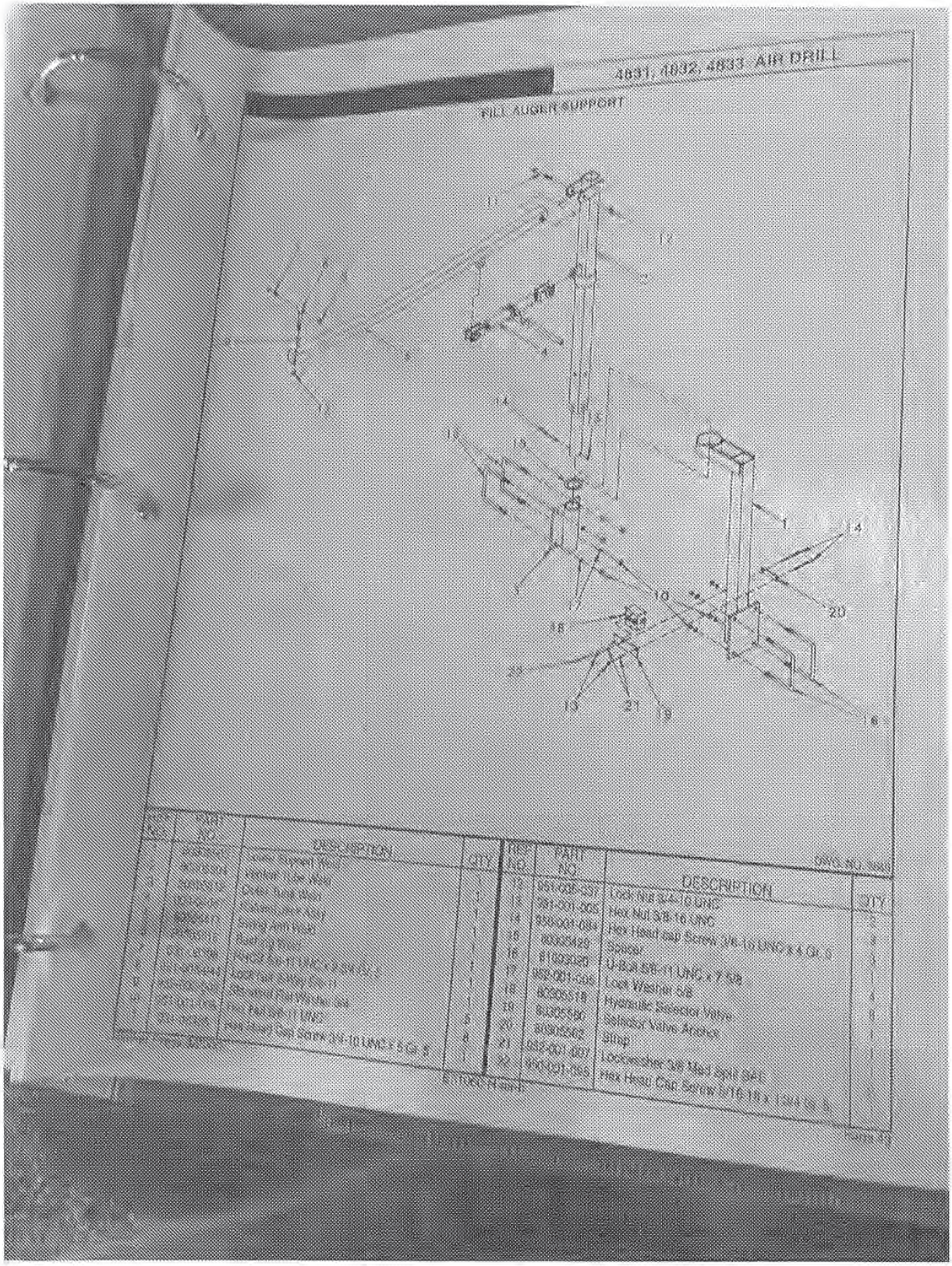
JM-22-0000487



JM-22-0000488

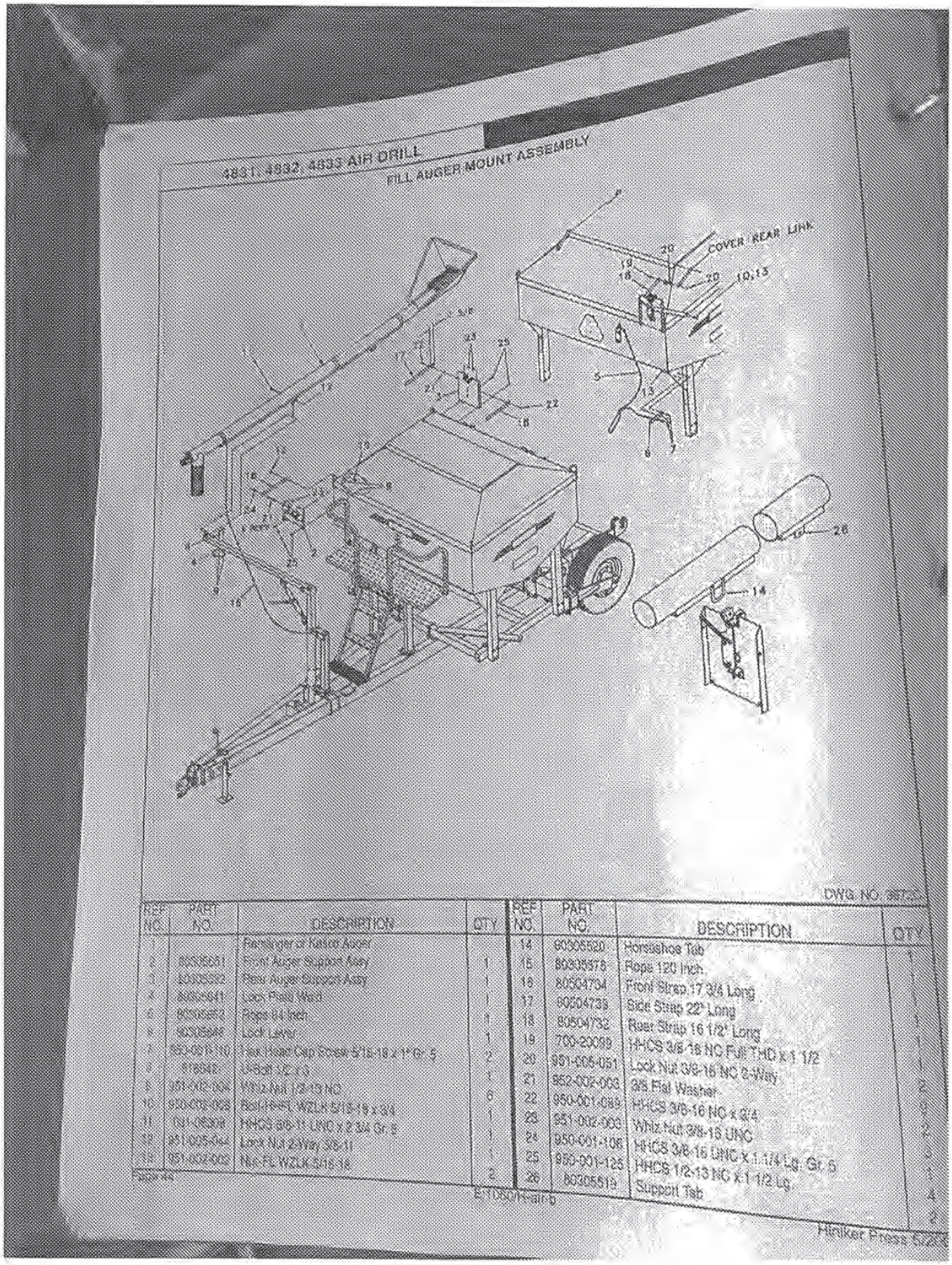


JM-22-0000489



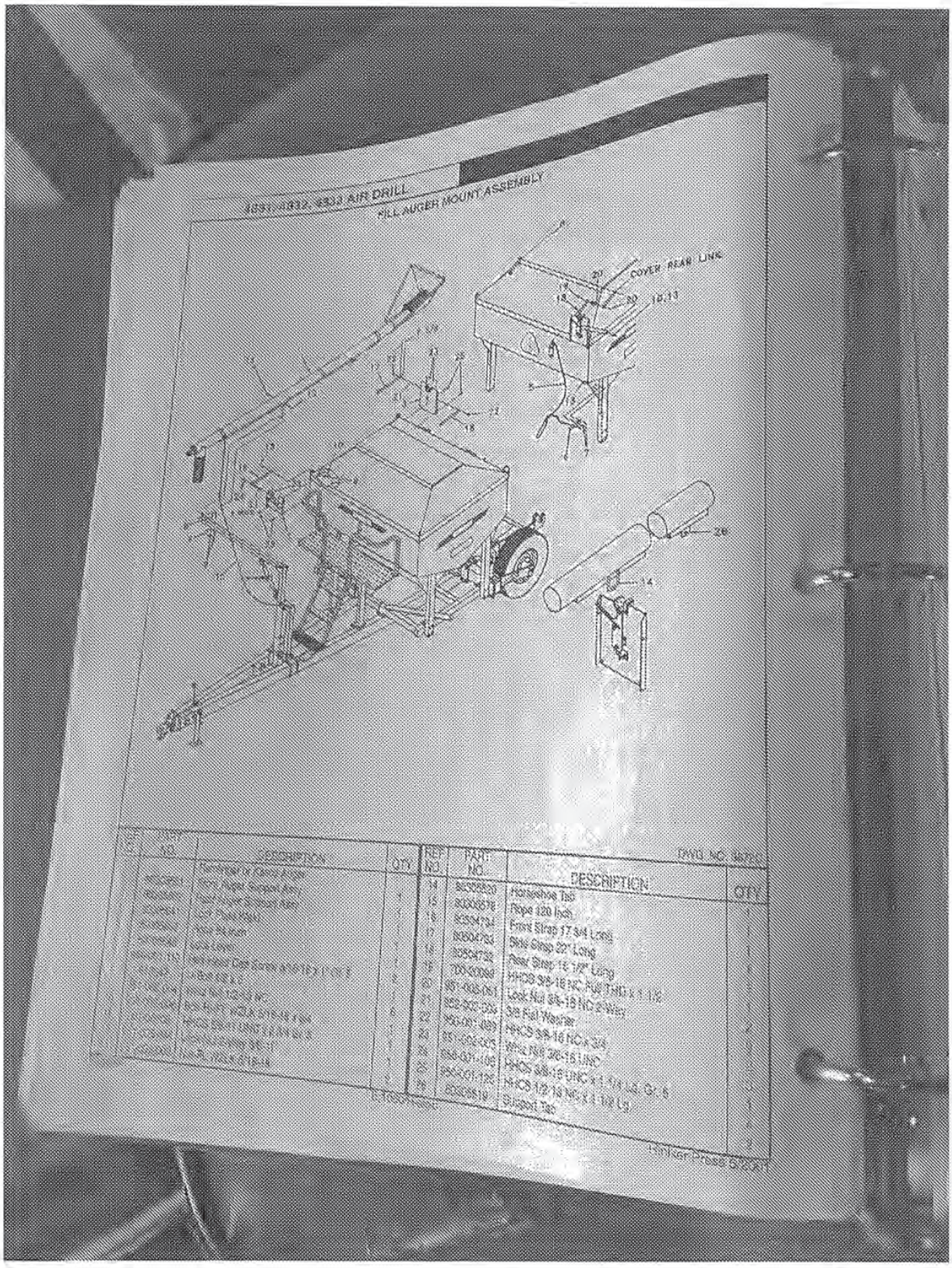
REF. NO.	PART NO.	DESCRIPTION	QTY.
13	951-025-337	Lock Nut 3/4-16 UNC	2
14	951-001-305	Hex Nut 3/8-16 UNC	3
15	950X001-094	Hex Head cap Screw 3/8-16 UNC x 4 Gr. 5	3
16	9000/5429	Screw	3
16	81803020	U-Bolt 5/8-11 UNC x 7 5/8	4
17	952-201-035	Lock Washer 5/8	8
18	8000/518	Hydraulic Selector Valve	1
19	8030/502	Selector Valve Anchor	1
20	8030/502	Strap	1
21	952-001-037	Lockwasher 3/8 Med Split DAE	2
22	950-001-056	Hex Head Cap Screw 3/8-16 x 1 3/4 Gr. 5	2

JM-22-0000490



REF NO.	PART NO.	DESCRIPTION	QTY.
1		Remainder of Kelch Auger	1
2	80305851	Front Auger Support Assy	1
3	80305852	Rear Auger Support Assy	1
4	8832-041	Lock Pivot Weld	1
5	80305853	Pipe 84 Inch	1
6	80305848	Lock Lever	1
7	952-0016-110	Flex Hose Cap Screw 5/16-18 x 1" Gr. 5	2
8	818548	U-Bolt 1/2" x 3	1
9	951-002-004	Whiz Nut 1/2-13 NC	6
10	950-002-008	Bolt Hex WZLK 5/16-18 x 3/4	1
11	701-08308	HHCS 3/8-11 UNC x 2 3/4 Gr. 5	1
12	951-005-004	Lock Nut 2-Way 3/8-11	1
13	951-002-002	Nut FL WZLK 5/16-18	2
14	80305520	Horseshoe Tab	1
15	80305878	Rope 120 Inch	1
16	80304704	Front Strap 17 3/4 Long	1
17	80304738	Side Strap 22" Long	1
18	80304732	Rear Strap 16 1/2" Long	1
19	700-20089	HHCS 3/8-16 NC Full THD x 1 1/2	1
20	951-005-051	Lock Nut 3/8-16 NC 2-Way	1
21	952-002-003	3/8 Flat Washer	2
22	950-001-089	HHCS 3/8-16 NC x 3/4	2
23	951-002-003	Whiz Nut 3/8-16 UNC	2
24	950-001-106	HHCS 3/8-16 UNC x 1 1/4 Lg. Gr. 5	3
25	950-001-125	HHCS 1/2-13 NC x 1 1/2 Lg.	1
26	80305519	Support Tab	4
			2

JM-22-0000491



JM-22-0000492

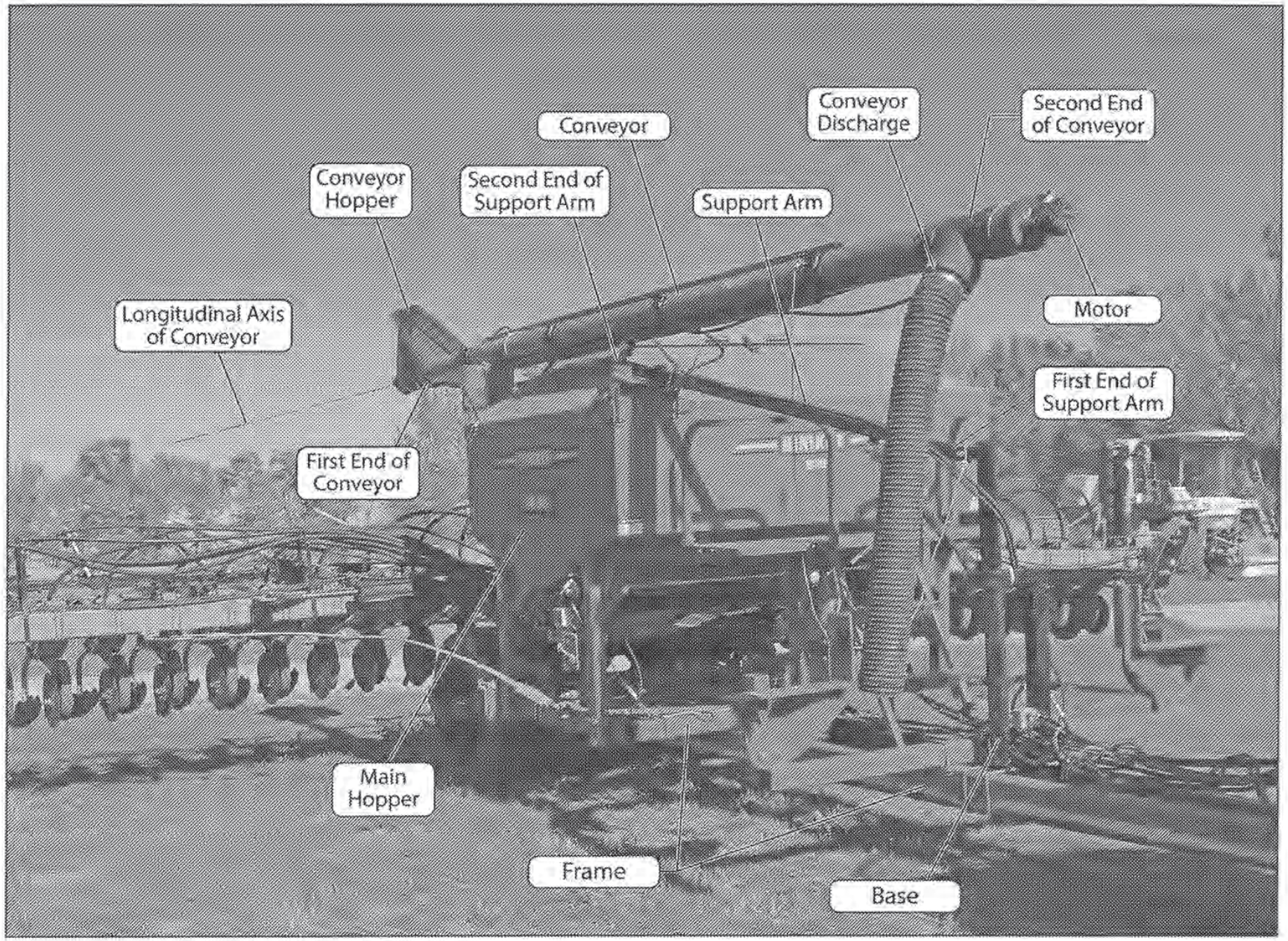

Conveyor
Conveyor Discharge
Second End of Conveyor
Conveyor Hopper
Second End of Support Arm
Support Arm
Longitudinal Axis of Conveyor
Motor
First End of Support Arm
First End of Conveyor
Main Hopper
Frame
Base

Photo 1

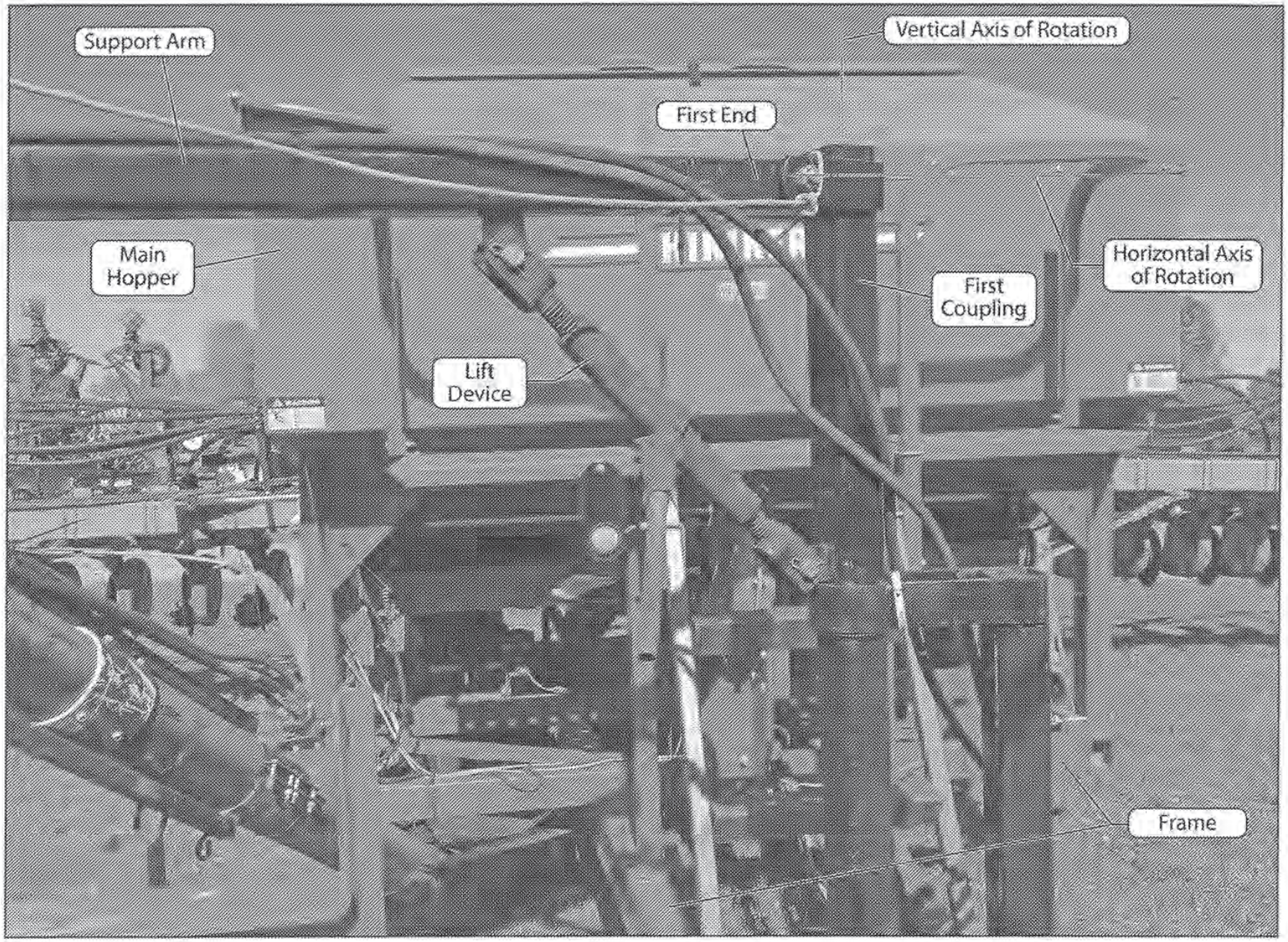

Support Arm
Vertical Axis of Rotation
First End
Main Hopper
Horizontal Axis of Rotation
First Coupling
Lift Device
Frame

Photo 2

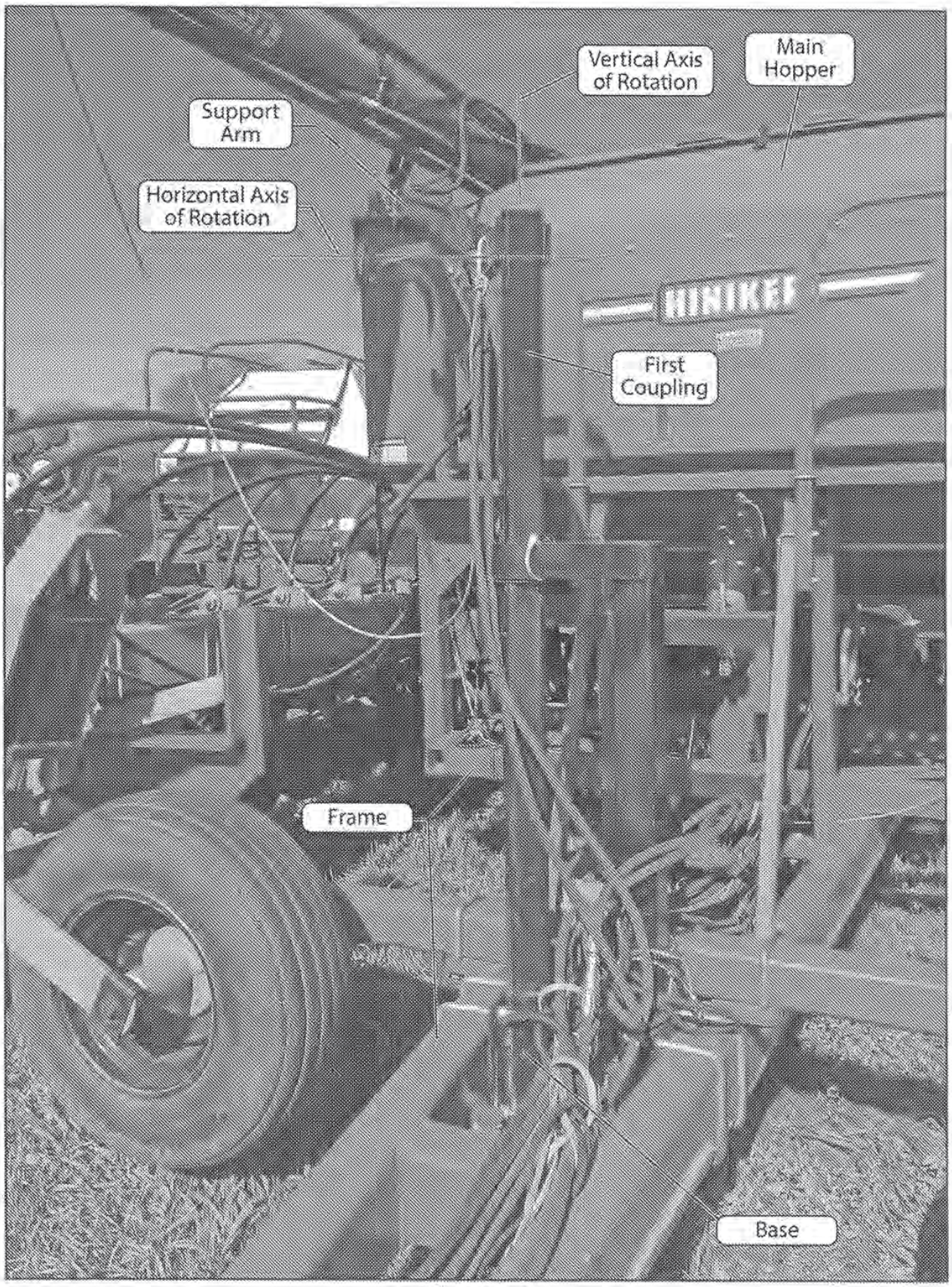

Vertical Axis of Rotation
Main Hopper
Support Arm
Horizontal Axis of Rotation
HINIKER
First Coupling
Frame
Base

Photo 3

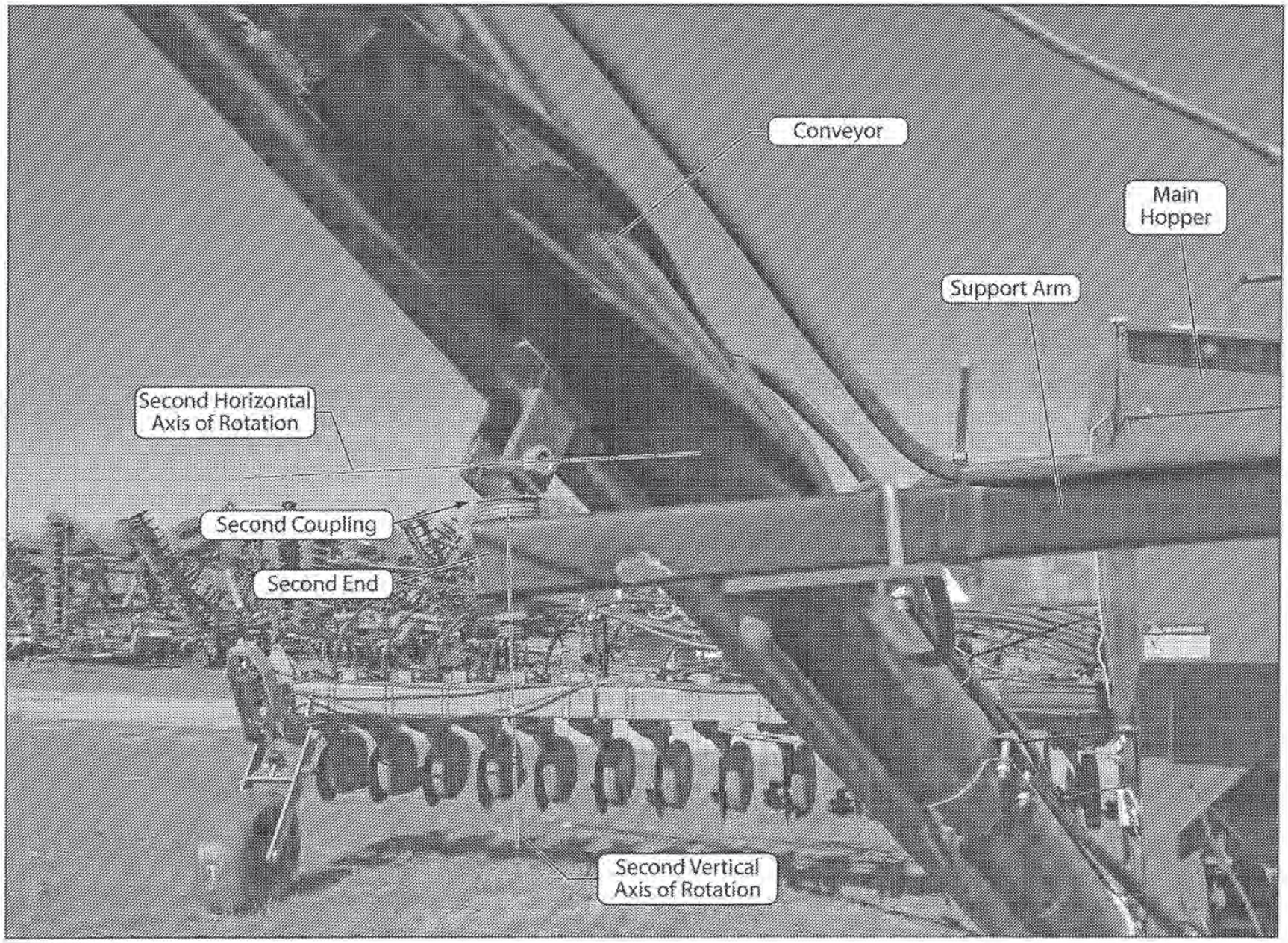

Conveyor
Main Hopper
Support Arm
Second Horizontal Axis of Rotation
Second Coupling
Second End
Second Vertical Axis of Rotation

Photo 4

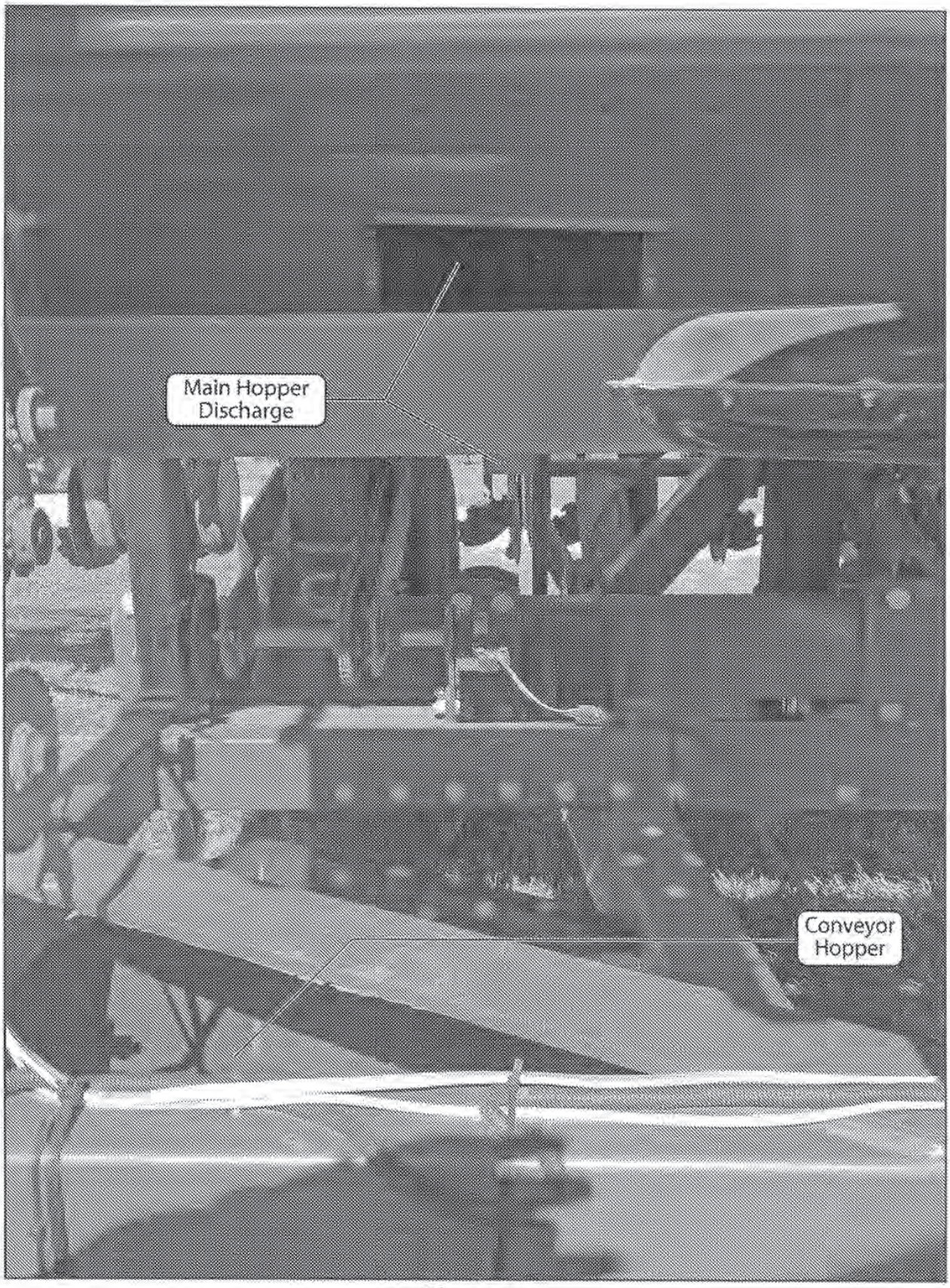


Photo 5



Photo 6

Photo 7

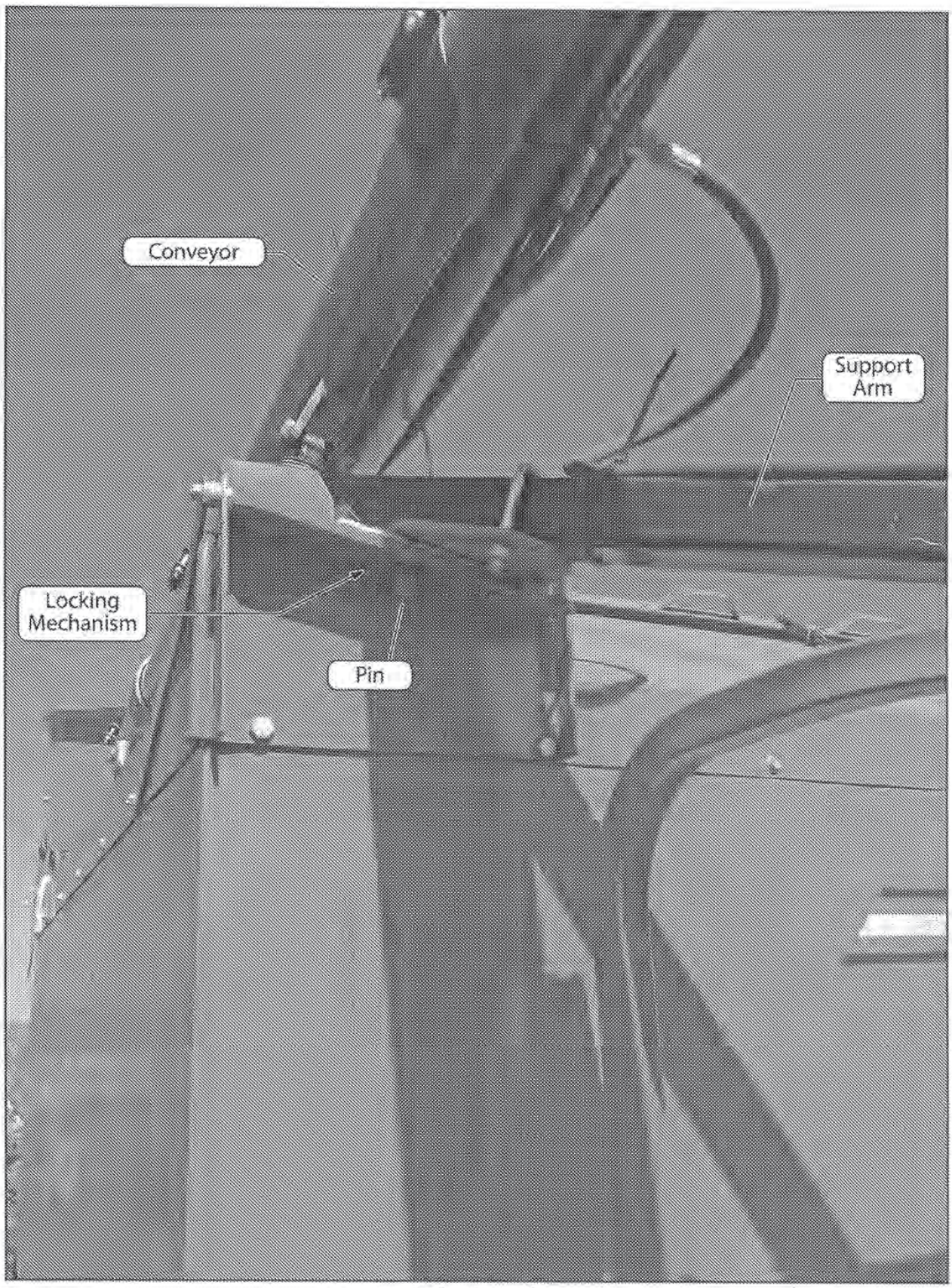
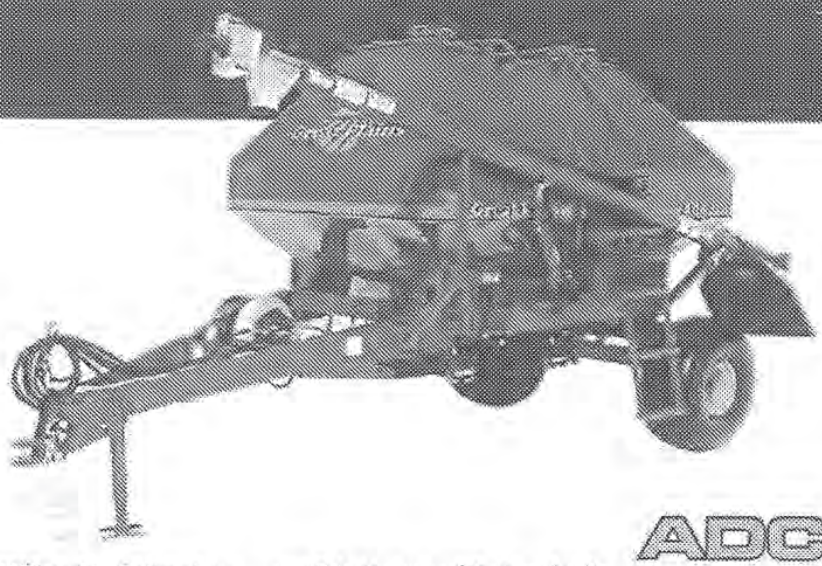


Photo 8

220 BUSHEL AIR CART

from Great Plains

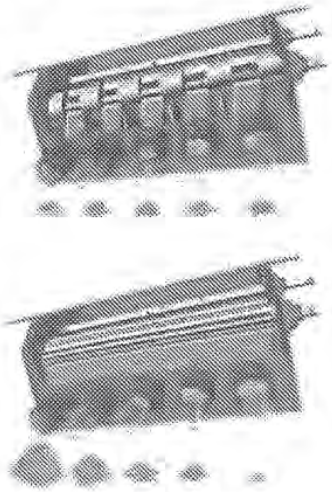


MODELS

ADC2220

The ADC2220 cart is designed as an economical high capacity bulk seeding alternative to conventional linear box drills. The ADC2220 is a pull-between cart designed to be semi-mounted to either HD, No-Till or Min-Till pull-behind Great Plains air implements.

CONFIGURED METER



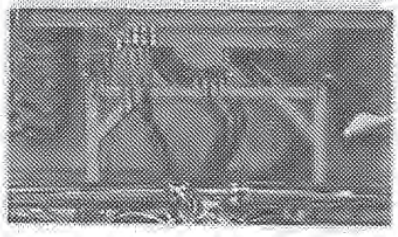
Competitive meters can cross-feed when on slopes (bottom image), starving "uphill" openers. Great Plains' meter box (top image) has one star wheel per tower, eliminating cross-feeding and increasing planting consistency.

LOAD/UNLOAD AUGER

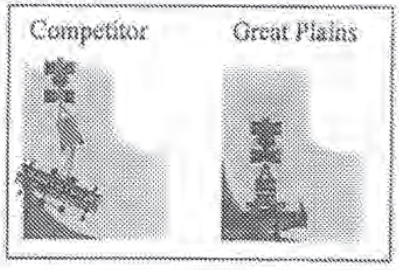


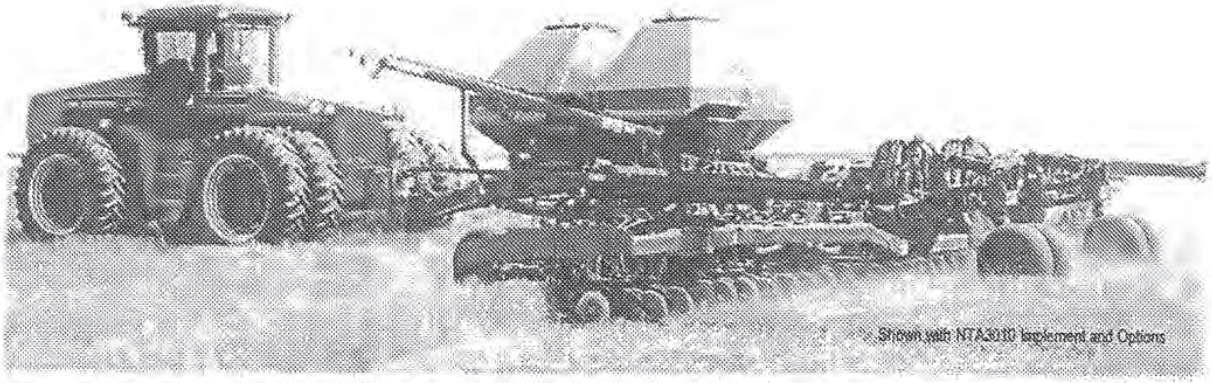
Dual purpose design allows you to load and unload with the same auger. It stores conveniently on the side of the cart and is balanced to allow easy handling.

SEMI MOUNTED IMPLEMENT

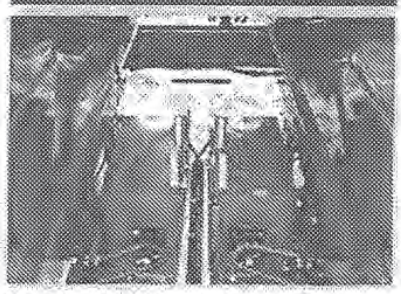


Our pull between Air Drill carts feature a semi-mounted cart-to-implement design. This design allows the implement to "Float" independent of the air cart and shortens the overall length on the air drill by up to 15'. This feature also give the cart and implement the ability to back into machine sheds and field corners.



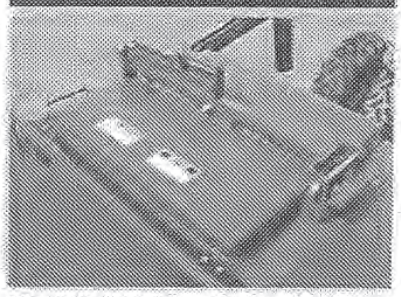


VERSATILE GEARBOXES



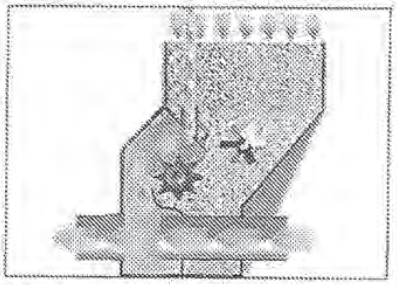
Five input and five output settings provide twenty five gear combinations without changing sprockets or breaking chains.

220 BUSHEL HOPPER DESIGN



Two 110 (3,876L) bushel steel hoppers provide ample capacity. The ADC2220 can be set up with seed in both hoppers or seed in one and fertilizer in the other.

PRESSURIZED TANKS



Pressurized hoppers allow seed to enter the air flow without restrictions for exceptional metering.

EASY READ PRESSURE GAUGE



Quickly check the fan pressure from the cab with the large pressure gauge conveniently located at the front of the cart.

220 BUSHEL AIR CART SPECIFICATIONS

Model Name	ADC2220
Capacity	2- 110 bu. (3,876L) Steel Hoppers
Weight	5060 lbs (2,431kg)
Width	12' 2" (3.70m)
Height	10' 6" (3.20m)
Length	18' 10" (5.74m)
Tire Size	16.5 - 16.1
Auger Size	6" (15.24cm)

OPTIONS

- Small Diameter Clevis
- Small Diameter Strap
- Large Diameter Cast Hitch

Note: All specifications subject to change without notice.
*Weights based on 7.5" (19.05cm) spacing and will vary depending on options.

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OHIO
WESTERN DIVISION

UNVERFERTH MFG. CO., INC.,	)	Civil Action No. 3:16-cv-02282-JZ
	)	
Plaintiff,	)	
	)	
v.	)	
	)	
J&M MFG. CO., INC.	)	
	)	
Defendant.	)	

J&M MFG. CO., INC.'S AMENDED INITIAL INVALIDITY CONTENTIONS

In accordance with L.P.R. 3.5 and L.P.R. 3.10, defendant, J&M Mfg. Co., Inc. ("J&M"), submits the following Amended Initial Invalidity Contentions. J&M makes this disclosure based on limited discovery and based on J&M's current understanding of Unverferth's construction of the claims of the patents-in-suit. J&M reserves the right to supplement or amend these Initial Invalidity Contentions as information is discovered or confirmed during fact discovery; information is discovered, confirmed, or provided by a party's consultant or expert after the party's contentions have been served; amendments are made to the pleadings; information is learned from or positions are taken by another party during the exchange-of-contentions process set forth in the Local Patent Rules; information is learned from or positions are taken by another party during the claim construction process; rulings are made by the Court, such as the Court's Claim Construction Order; and as otherwise permitted or required under the Federal Rules of Civil Procedure, the Local Rules, and the Local Patent Rules.

A. Identification of Prior Art

Below is a list of prior art that anticipates or renders obvious U.S. Patent Nos. 8,221,047 ("the '047 Patent") and 8,967,940 ("the '940 Patent"):

Patent Number	Country of Origin	Date of Issue
3,498,483 "Meharry '483"	U.S.	March 3, 1970
4,491,216 "Sawby '216"	U.S.	Jan. 1, 1985
5,718,556 "Forsyth '556"	U.S.	Feb. 17, 1998
5,888,044 "Baskerville '044"	U.S.	March 30, 1999
7,500,814 "Meyer '814"	U.S.	Mar. 10, 2009
7,500,817 "Furrer '817"	U.S.	Mar. 10, 2009
2,465,667 "Deboffles '667"	France	Mar. 27, 1981
2,416,677 "Hundeby '677"	Canada	Aug. 13, 2004 (published)

The '047 and '940 Patents are also invalid in view of other non-patent prior art:

Prior Art	Date	Type
Hiniker Air Seeder Cart with Auger Mount Kit	Ordered on October 2, 2000 Shipped on January 31, 2001	prior sale (annotated photographs)
Hiniker Model 4836 Air Seeder Cart Operator's Manual	January 1999	printed publication
Hiniker Models 4831, 4832, 4833 Air Seeder Cart Assembly Manual	January 2000	printed publication
Hiniker Air Seeder Cart with Auger Mount Kit	May 1998	public use (video)
Great Plains Air Drill Cart Parts Manual for Model	March 1, 2000	printed publication

ADC2220		
Great Plains Air Drill Cart Parts Manual for Model ADC2220	May 1, 1997	printed publication
Great Plains ADC2220 Publication	prior to February 15, 2007[1]	printed publication
Great Plains Air Drill Cart Model ADC2220	prior to February 15, 2007	public use and prior sale

The '047 and '940 Patents are also invalid because Unverferth's seed tenders were publically used or sold in the U.S. more than one year prior to February 15, 2007, the filing date of U.S. Provisional Application No. 60/901,321. Discovery has just begun and J&M reserves the right to supplement these contentions regarding Unverferth's activities regarding its seed tenders more than one year prior to February 15, 2007.

B. Invalidity Positions

The chart required by L.P.R. 3.5(c) is attached as Exhibit 1.

The Hiniker Air Seeder Cart with Auger Mount Kit anticipates at least claims 1 and 20 of the '047 Patent and claims 1, 8, and 16 of the '940 Patents.

Meharry '483, Sawby '216, Forsyth '556, Baskerville '044, Meyer '814, Deboffles '667, Hundeby '677, Hiniker Air Seeder Cart with Auger Mount Kit, and Great Plains Air Drill Cart disclose a seed tender with a hopper and a conveyor that can be moved between a load position to dispense agricultural product into the hopper or an unload position to receive agricultural product from the hopper discharge opening ("the load/unload prior art"). Any of the load/unload prior art in combination with Furrer '817 render all of the asserted claims obvious. Alternatively, all of the asserted claims are obvious in view of the load/unload prior art because it would have been a matter of mere design choice to place a base under the hopper and rotably couple a support arm to the base.

[1] J&M is investigating the actual publication date.

The seed tender described and claimed in the '047 and '940 Patents embodies well-known structures and functionality. There is nothing inventive about it. In fact, the basic concept–a send tender with a conveyor moveable between load and unload positions–had been around for forty years before Unverferth filed its provisional application in 2007. The seed tender in Meharry '483 discloses a seed tender with a conveyor moveable between load and unload positions. The other load/unload prior art also teach this basic concept.

The seed tender in the '047 and '940 Patents copies all the main components of the load/unload prior art, but places the base under the main hopper discharge. There is nothing inventive about copying the prior art and then positioning the base under the main hopper discharge. In fact, Furrer '817 already teaches a base under the main hopper discharge and supporting the conveyor from below so that the conveyor can rotate about both vertical and horizontal axes relative to the base. The asserted claims are clearly obvious in view of any combination of the load/unload prior art with Furrer '817 and because moving the base under the main hopper discharge was merely a simple design choice. Further, once the base is located under the main hopper or main hopper discharge, which Furrer '817 clearly shows, all elements of the asserted dependent claims become inherent features of that design choice.

In addition to being invalid in view of prior art, certain asserted claims are invalid for failing to comply with 35 U.S.C. § 112:

- Claims 1 and 20 of the '047 Patent and claims 1, 8, and 16 of the '940 Patent are indefinite because the term "first coupling" viewed in light of the specification and prosecution history, fails to inform those skilled in the art about the scope of the invention with reasonable certainty. The specification does not mention the term "first coupling" and the figures do not identify any structure as the "first coupling."

- Claims 1 and 20 of the '047 Patent and claims 1, 8, and 16 of the '940 Patent are indefinite because the term "first vertical axis of rotation" viewed in light of the specification and prosecution history, fails to inform those skilled in the art about the scope of the invention with reasonable certainty. While the specification mentions a "vertical axis" at col. 3, l. 41 of the '047 Patent, for example, that "vertical axis" is not described with respect to the "first coupling" as recited in the claim, but with respect to

the "support arm" instead. The figures do not identify where the "first vertical axis of rotation" is located.

- Claims 1 and 20 of the '047 Patent and claims 1, 8, and 16 of the '940 Patent are indefinite because the term "first horizontal axis of rotation" viewed in light of the specification and prosecution history, fails to inform those skilled in the art about the scope of the invention with reasonable certainty. The specification does not mention the term "first horizontal axis of rotation" and the figures do not identify where the "first horizontal axis of rotation" is located.

- Claims 16 and 20 of the '047 Patent are indefinite because the term "locking mechanism" viewed in light of the specification and prosecution history, fails to inform those skilled in the art about the scope of the invention with reasonable certainty. The specification does not mention the term "locking mechanism" and the figures do not identify any structure as the "locking mechanism."

- Claim 16 of the '940 Patent is indefinite because the term "first conveyor axis of rotation" viewed in light of the specification and prosecution history, fails to inform those skilled in the art about the scope of the invention with reasonable certainty. The specification does not mention the term "first conveyor axis of rotation" and the figures do not identify where the "first conveyor axis of rotation" is located.

- Claims 1 and 20 of the '047 Patent and claims 1, 8, and 16 of the '940 Patent are not enabled in view of the term "first coupling" because one skilled in the art, after reading the specification, could not practice the claimed invention without undue experimentation.

- Claim 21 of the '047 Patent is invalid because it is not narrower in scope than independent claim 20.

C. Unenforceability

At this time, J&M does not contend that the '047 or '940 Patents are unenforceable for inequitable conduct. J&M reserves the right to amend its unenforceability contention as discovery in this case progresses and additional information becomes available or known to J&M.

D. Document Production

In accordance with L.P.R. 3.6, J&M is producing documents with these invalidity contentions bearing production numbers JM-22-0000229-622. A translation of Deboffles '667 is produced with these amended contentions bearing production numbers JM-22-0021686-692.

Dated: February 7, 2017

Respectfully Submitted,

/s/ J. Robert Chambers

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ATTORNEYS FOR DEFENDANT J&M MFG. CO., INC.

CERTIFICATE OF SERVICE

I hereby certify that, on February 7, 2017, I served **J&M MFG. CO., INC.'S AMENDED INITIAL INVALIDITY CONTENTIONS** on counsel of record via electronic mail.

/s/ P. Andrew Blatt

EXHIBIT 1

U.S. Patent No. 8,221,047

Claim 1	References
A seed or grain tender comprising:	Meharry '483 at col. 2, l. 35 (gravity bed vehicle 10). Sawby '216 at col. 2, ll. 8-10 (grain handling apparatus 1). Forsyth '556 at col. 4, ll. 15-17. Baskerville '044 at col. 3, l. 53 (seed cart 1). Meyer '814 at col. 2, l. 31 (cart 10). Furrer '817 at col. 3, ll. 41-42 (seed tender). Hundeby '677 at pg. 4 (cart 1). Deboffles '667 at Figs. 1-4 (No. 1). Hiniker Air Seeder Cart at Photo 1.[1] ADC2220 at Cover page.[2]

[1] The Hiniker Air Seeder Cart in the attached photographs is also described in the Hiniker Air Seeder Cart Operator's Manual (JM-22-0000310-376) dated January 1999 and Assembly Manual (JM-22-0000368-416) dated January 2000, *see, e.g.*, JM-22-0000315, 355, 356, 359, 369, 393, 398, 406. *See also* JM-22-0000418. A video shot May 1998 showing the structure and operation of a Hiniker Air Seeder Cart was produced with production number JM-22-0000425.

[2] Citations to ADC2220 refers pages from the Great Plains Air Drill Cart Parts Manual for Model ADC2220 dated 3/1/2000 having production numbers JM-22-0000554-620. A second ADC2220 Parts Manual dated 5/1/1997 was also produced at JM-22-0000493-553. A Great Plains ADC2220 Publication ("ADC2220 Publication") was also produced at JM-22-0000621-622. ADC2220 also refers to the prior public use and prior sale of the Great Plains Air Drill Cart Model No. ADC2200.

a frame	Meharry '483 at Figs. 1-3 (frame 20). Forsyth '556 at col. 4, l. 45 (frame 18). Baskerville '044 at col. 3, l. 55 (lower frame 2). Meyer '814 at col. 2, l. 37 (frame 12). Furrer '817 at col. 4, ll. 5-6 (frame 22). Hundeby '677 at Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 2). Hiniker Air Seeder Cart at Photos 1-3. ADC2220 at 2-1 (No. 1).

a main hopper mounted on said frame and having a main hopper discharge	Meharry '483 at col. 2, ll. 39 and 46 (gravity bed 21 and opening 12). Sawby '216 at col. 2, ll. 11-12 (grain bins or hopper 2); col. 3, l. 20 (outlet 36). Forsyth '556 at col. 4, l. 29 (compartment 6) and col. 5, l. 20 (ports). Baskerville '044 at col. 3, l. 58 (grain bin 11) and col. 4, ll. 3-4 (discharge opening 25). Meyer '814 at col. 2, l. 34 (first and second tanks 14, 16); col. 2, l. 36 (outlet 20). Furrer '817 at col. 3, ll. 45-46 (seed storage bin 13) and col. 4, l. 66–col. 5, l. 4 and Fig. 1A. Hundeby '677 at pg. 4 (tanks 2 and discharge 21) and Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 4). Hiniker Air Seeder Cart at Photos 1-3 and 5. ADC2220 at 2-11 and 2-13 (Nos. 5 and 6).
a base mounted on said frame below said main hopper discharge;	Sawby '216 at col. 2, l. 17 (base plate 6). Furrer '817 at col. 4, l. 26 (turret mount 28). Deboffles '667 at Figs. 1-4 (lower end of No. 2). Hiniker Air Seeder Cart at Photos 1 and 3.

a support arm having first and second ends;	Meharry '483 at col. 3, l. 8 and Figs. 1-3 (arm 41). Sawby '216 at col. 2, l. 25 (boom 10). Forsyth '556 at col. 4, l. 24 and Figs. 1 and 2 (crane 16) and col. 7, l. 48 (crane assembly 116) and Fig. 8. Baskerville '044 at col. 4, l. 43 (boom 53). Meyer '814 at col. 2, l. 55 (first arm 40). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder). Hundeby '677 at Figs. 1, 5, and 6 (unnumbered diagonal member supporting No. 15, as shown in Fig. 5). Deboffles '667 at Figs. 1-4 (Nos. 6 and 7). Hiniker Air Seeder Cart at Photos 1-4. ADC2220 at 7-1 (Nos. 15 and 20).

a first coupling connecting said first end of said support arm with said base, said first coupling being rotatable in relation to said base about a first vertical axis of rotation, and said first end of said support arm being rotatable in relation to said first coupling about a first horizontal axis of rotation;	Sawby '216 at col. 2, l. 17 and Figure (sleeve 7). Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7. Deboffles '667 at Figs. 1-4 (vertical axis X-X). Hiniker Air Seeder Cart at Photos 2 and 3. Other prior showing a first coupling: Meharry '483 at col. 3, l. 12 and Figs. 1-3 (tubular member 45). Forsyth '556 at col. 7, l. 3 and Figs. 1, 2, and 4 (vertical bar 42) and col. 7, l. 33 (first pivot bracket 119) and Fig. 8. Baskerville '044 at col. 4, l. 54 (tube 61). Meyer '814 at col. 2, l. 55 ("first arm 40 is pivotally coupled with frame 12") and Figs. 2 and 3. ADC2220 at 7-1 (structural member (dashed line) to which support arm 20 connects to via shaft 21).

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, a conveyor discharge at said second end, and an internal elevator for moving seed or grain from said conveyor hopper to said conveyor discharge; and	Meharry '483 at col. 2, l. 50 (auger arrangement 25). Sawby '216 at col. 2, ll. 48-49 ("The auger . . . includes the casing 17 . . .") and Figure. Forsyth '556 at col. 4, l. 21 (conveyor 10) and col. 7, l. 19 (belt 74). Baskerville '044 at col. 4, ll. 13 and 45 (conveyor 31 and belt 55). Meyer '814 at col. 2, ll. 43-44 (conveyor 32 and belt). Furrer '817 at col. 3, l. 43 (conveyor 11) and col. 4, ll. 29-31 (belt) and Fig. 3. Hundeby '677 at pg. 4 (auger 15, inlet 16, and discharge 21) and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (No. 8). Hiniker Air Seeder Cart at Photo 1. ADC2220 at 7-1 and 8-1.

a second coupling connecting said second end of said support arm with said conveyor at an approximate center of gravity of said conveyor, said second coupling defining a second vertical axis of rotation that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable in relation to said second end of said support arm about said second vertical axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper.	Meharry '483 at col. 3, l. 20 (line 51) and col. 1, ll. 11-18 and Figs. 2 and 3. Sawby '216 at col. 2, l. 35 (bracket 16) and col. 3, ll. 4-25 and Figure. Forsyth '556 at col. 7, ll. 11-14 and col. 8, ll. 11-49 and Figs. 1, 2, and 4. Meyer '814 at col. 2, ll. 45-47 and 58 (second arm 42). Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (vertical axis Z-Z). Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1 (the various components at the end of support arm 15, e.g., No. 18); ADC2220 Publication at 14 ("Dual purpose design allows you to load and unload with the same auger.").
Claim 2	
The seed or grain tender of claim 1, wherein said support arm extends upwardly at an acute angle from said base.	Sawby '216 at col. 2, ll. 32-34 and Figure. Furrer '817 at Figs 1A, 2, 5, and 7 (hydraulic cylinder). Hiniker Air Seeder Cart at Photos 1 and 3. Other prior art showing a support arm: Forsyth '556 at Fig. 2. Baskerville '044 at Fig. 4. Hundeby '677 at Figs. 5 and 6.

Claim 3	
The seed or grain tender of claim 2, wherein said conveyor is parallel to said support arm in said unloading position.	Inherent in light of proposed combination of the load/unload prior art with Furrer '817.
Claim 4	
The seed or grain tender of claim 3, wherein said conveyor is disposed above said support arm in said unloading position.	Inherent in light of proposed combination of the load/unload prior art with Furrer '817. Meharry '483 at Fig. 2. Sawby '216 at Figure. Baskerville '044 at Fig. 4. Hundeby '677 at Figs. 5 and 6. Deboffles '667 at Figs. 2-4. Hiniker Air Seeder Cart at Photo 6.

Claim 5	
The seed or grain tender of claim 1, wherein said conveyor is rotatable in relation to said second coupling about a second horizontal axis of rotation.	Meharry '483 at Figs. 2 and 3. Sawby '216 at col. 2, ll. 40-42. Forsyth '556 at Figs. 1, 2, and 4. Baskerville '044 at col. 4, ll. 42-43 and Figs. 4-7. Meyer '814 at col. 3, ll. 2-8 and Fig. 4. Hundeby '677 at Abstract and Figs. 5 and 6. Hiniker Air Seeder Cart at Photos 4, 6, and 7. ADC2220 at 7-1 (No. 18).
Claim 6	
The seed or grain tender of claim 5, wherein said second horizontal axis of rotation extends through said second coupling.	Sawby '216 at col. 2, ll. 40-42 and Figure. Forsyth '556 at Fig. 4. Baskerville '044 at col. 4, ll. 42-43 and Figs. 4-7. Meyer '814 at col. 3, ll. 2-8 and Fig. 4. Hundeby '677 at Figs. 5 and 6. Hiniker Air Seeder Cart at Photo 4. ADC2220 at 7-1 (No. 18).

Claim 7	
The seed or grain tender of claim 1, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.	Meharry '483 at col. 3, l. 4 (stand 40).
Claim 9	
The seed or grain tender of claim 1, wherein said first vertical axis extends through said base.	Sawby '216 at col. 2, ll. 40-42 and Figure. Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7. Debofles '667 at Figs. 1-4. Hiniker Air Seeder Cart at Photo 3.

Claim 10	
The seed or grain tender of claim 1, wherein said second end of said support arm terminates at or near said approximate center of gravity of said conveyor.	Meharry '483 at Figs. 2 and 3. Sawby '216 at col. 2, ll. 44-47 and Figure. Forsyth '556 at col. 7, ll. 12-14. Baskerville '044 at Figs. 5 and 9. Meyer '814 at Fig. 2. Hundeby '677 at Figs. 5 and 6. Deboffles '667 at Figs. 1-4. Hiniker Air Seeder Cart at Photos 1, 7, and 8. ADC2220 at 7-1.
Claim 11	
The seed or grain tender of claim 1, wherein said first end of said support arm is fixed at a first height and said second end of said support arm is pivotable between a range of heights.	Sawby '216 at col. 2, ll. 32-34 and Figure. Forsyth '556 at col. 7, ll. 6-10 and 56-63 and Figs. 4 and 8. Baskerville '044 at col. 5, ll. 6-16 and Figs. 4-5. Hiniker Air Seeder Cart at Photos 1, 2, 6, and 7.

Claim 12	
The seed or grain tender of claim 1, further comprising a lift device for adjusting a height of said second end of said support arm.	Meharry '483 at col. 3, l. 18 (winch 50). Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder). Hiniker Air Seeder Cart at Photo 2.
Claim 13	
The seed or grain tender of claim 12, wherein said lift device is a pressurized cylinder.	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder).
Claim 14	
The seed or grain tender of claim 12, wherein said lift device is a hydraulic cylinder.	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder).

Claim 16	
The seed or grain tender of claim 1, further comprising a locking mechanism for locking or unlocking said support arm in relation to said base.	Meharry '483 at col. 2, l. 52 (loops 27 and hooks 28). Forsyth '556 at col. 5, l. 44 (support 19) and Fig. 3. Meyer '814 at col. 3, ll. 2-8 and Fig. 1. (In the transport position the conveyor 32 rests in a cradle that locks the conveyor 32 and, therefore, first arm 40 in place. Furrer '817 at Figs. 3 and 5. Hiniker Air Seeder Cart at Photo 8. ADC2220 at 7-1 (Nos. 1-8).
Claim 19	
The seed or grain tender of claim 17, wherein said internal elevator includes a motor-driven belt.	Forsyth '556 at col. 4, l. 68 (motor 75). Baskerville '044 at col. 4, ll. 13, 45, 49 (conveyor 31, belt 55, and drive motor 58). Meyer '814 at col. 2, ll. 43-44 and 50 (conveyor 32, belt, and motor 38). Furrer '817 at col. 3, l. 43 (conveyor 11) and col. 4, ll. 29-31 (belt and motor 30) and Fig. 3.

Claim 20	
A seed or grain tender comprising:	Meharry '483 at col. 2, l. 35 (gravity bed vehicle 10). Sawby '216 at col. 2, ll. 8-10 (grain handling apparatus 1). Forsyth '556 at col. 4, ll. 15-17. Baskerville '044 at col. 3, l. 53 (seed cart 1). Meyer '814 at col. 2, l. 31 (cart 10). Furrer '817 at col. 3, ll. 41-42 (seed tender). Hundeby '677 at pg. 4 (cart 1). Deboffles '667 at Figs. 1-4 (No. 1). Hiniker Air Seeder Cart at Photo 1. ADC2220 at Cover page.

a frame;	Meharry '483 at Figs. 1-3 (frame 20). Forsyth '556 at col. 4, l. 45 (frame 18). Baskerville '044 at col. 3, l. 55 (lower frame 2). Meyer '814 at col. 2, l. 37 (frame 12). Furrer '817 at col. 4, ll. 5-6 (frame 22). Hundeby '677 at Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 2). Hiniker Air Seeder Cart at Photos 1-3. ADC2220 at 2-1 (No. 1).

a main hopper mounted on said frame and having a main hopper discharge;	Meharry '483 at col. 2, ll. 39 and 46 (gravity bed 21 and opening 12). Sawby '216 at col. 2, ll. 11-12 (grain bins or hopper 2); col. 3, l. 20 (outlet 36). Forsyth '556 at col. 4, l. 29 (compartment 6) and col. 5, l. 20 (ports). Baskerville '044 at col. 3, l. 58 (grain bin 11) and col. 4, ll. 3-4 (discharge opening 25). Meyer '814 at col. 2, l. 34 (first and second tanks 14, 16); col. 2, l. 36 (outlet 20). Furrer '817 at col. 3, ll. 45-46 (seed storage bin 13) and col.4, l. 66–col. 5, l. 4 and Fig. 1A. Hundeby '677 at pg. 4 (tanks 2 and discharge 21) and Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 4). Hiniker Air Seeder Cart at Photos 1-3 and 5. ADC2220 at 2-11 and 2-13 (Nos. 5 and 6).
a base mounted on said frame below said main hopper discharge;	Sawby '216 at col. 2, l. 17 (base plate 6). Furrer '817 at col. 4, l. 26 (turret mount 28). Deboffles '667 at Figs. 1-4 (lower end of No. 2). Hiniker Air Seeder Cart at Photos 1 and 3.

a support arm having first and second ends;	Meharry '483 at col. 3, l. 8 and Figs. 1-3 (arm 41). Sawby '216 at col. 2, l. 25 (boom 10). Forsyth '556 at col. 4, l. 24 and Figs. 1 and 2 (crane 16) and col. 7, l. 48 (crane assembly 116) and Fig. 8. Baskerville '044 at col. 4, l. 43 (boom 53). Meyer '814 at col. 2, l. 55 (first arm 40). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder). Hundeby '677 at Figs. 1, 5, and 6 (unnumbered diagonal element supporting No.15, as shown in Fig. 5). Deboffles '667 at Figs. 1-4 (Nos. 6 and 7). Hiniker Air Seeder Cart at Photos 1-4. ADC2220 at 7-1 (Nos. 15 and 20).

a first coupling connecting said first end of said support arm with said base, said first coupling being rotatable in relation to said base about a first vertical axis of rotation, and said first end of said support arm being rotatable in relation to said first coupling about a first horizontal axis of rotation;	Sawby '216 at col. 2, l. 17 and Figure (sleeve 7). Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7. Deboffles '667 at Figs. 1-4 (vertical axis X-X). Hiniker Air Seeder Cart at Photos 2 and 3. Other prior showing a first coupling: Meharry '483 at col. 3, l. 12 and Figs. 1-3 (tubular member 45). Forsyth '556 at col. 7, l. 3 and Figs. 1, 2, and 4 (vertical bar 42) and col. 7, l. 33 (first pivot bracket 119) and Fig. 8. Baskerville '044 at col. 4, l. 54 (tube 61). Meyer '814 at col. 2, l. 55 ("first arm 40 is pivotally coupled with frame 12") and Figs. 2 and 3. ADC2220 at 7-1 (structural member (dashed line) to which support arm 20 connects to via shaft 21).
a lift device extending from said base to a portion of said support arm between said first and second ends such that said support arm extends upwardly at an acute angle from said base;	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder). Hiniker Air Seeder Cart at Photo 2. Other prior art showing a lift device: Meharry '483 at col. 3, l. 18 (winch 50). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64) and Fig. 4.

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, a conveyor discharge at said second end, and a motor-driven elevator for moving seed or grain from said conveyor hopper to said conveyor discharge; and	Meharry '483 at col. 2, l. 50 (auger arrangement 25). Sawby '216 at col. 2, ll. 48-49 ("The auger . . . includes the casing 17 . . .") and Figure. Forsyth '556 at col. 4, l. 21 (conveyor 10) and col. 7, l. 19 (belt 74) and col. 3, l. 58 (motor 75). Baskerville '044 at col. 4, ll. 13, 45, and 49 (conveyor 31, belt 55, and motor 58). Meyer '814 at col. 2, ll. 43-44 and 50 (conveyor 32, belt, and motor 38). Furrer '817 at col. 3, l. 43 (conveyor 11) and col. 4, ll. 29-31 (belt and motor 30) and Fig. 3. Hundeby '677 at pg. 4 (auger 15, inlet 16, and discharge 17) and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (No. 8). Hiniker Air Seeder Cart at Photo 1. ADC2220 at 7-1 and 8-1.

a second coupling connecting said second end of said support arm with said conveyor at an approximate center of gravity of said conveyor, said second coupling defining a second vertical axis of rotation that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable in relation to said second end of said support arm about said second vertical axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper, wherein said conveyor is disposed parallel to and above said support arm in said unloading position; and	Meharry '483 at col. 3, l. 20 (line 51) and col. 1, ll. 11-18 and Figs. 2 and 3. Sawby '216 at col. 2, l. 35 (bracket 16) and col. 3, ll. 4-25 and Figure. Forsyth '556 at col. 7, ll. 11-14 and col. 8, ll. 11-49 and Figs. 1, 2, and 4. Meyer '814 at col. 2, ll. 45-47 and 58 (second arm 42). Hundeby '677 at Abstract and Figs. 5 and 6. Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1 (the various components at the end of support arm 15, e.g., No. 18); ADC2220 Publication at 14 ("Dual purpose design allows you to load and unload with the same auger.").
a locking mechanism for locking and unlocking said support arm in relation to said base.	Meharry '483 at col. 2, l. 52 (loops 27 and hooks 28). Forsyth '556 at col. 5, l. 44 (support 19) and Fig. 3. Meyer '814 at col. 3, ll. 2-8 and Fig. 1. In the transport position the conveyor 32 rests in a cradle that locks the conveyor 32 and, therefore, first arm 40 in place. Furrer '817 at Figs. 3 and 5. Hiniker Air Seeder Cart at Photo 8. ADC2220 at 7-1 (Nos. 1-8).

Claim 21	
The seed or grain tender of claim 20, wherein said conveyor is disposed above said support ann in said unloading position.	Inherent in light of proposed combination of the load/unload prior art with Furrer '817. Meharry '483 at Fig. 2. Sawby '216 at Figure. Baskerville '044 at Fig. 4. Hundeby '677 at Figs. 5 and 6. Deboffles '667 at Figs. 2-4. Hiniker Air Seeder Cart at Photo 6.
Claim 22	
The seed or grain tender of claim 20, wherein said conveyor is rotatable in relation to said second coupling about a second horizontal axis of rotation.	Meharry '483 at Figs. 2 and 3. Sawby '216 at col. 2, ll. 40-42. Forsyth '556 at Figs. 1, 2, and 4. Baskerville '044 at col. 4, ll. 42-43 and Figs. 4-7. Meyer '814 at col. 3, ll. 2-8 and Fig. 4. Hundeby '677 at Abstract and Figs. 5 and 6. Hiniker Air Seeder Cart at Photos 4, 6, and 7. ADC2220 at 7-1 (No. 18).

Claim 23	
The seed or grain tender of claim 22, wherein said second horizontal axis of rotation extends through said second coupling.	Sawby '216 at col. 2, ll. 40-42 and Figure. Forsyth '556 at Fig. 4. Baskerville '044 at col. 4, ll. 42-43 and Figs. 4-7. Meyer '814 at col. 3, ll. 2-8 and Fig. 4. Hundeby '677 at Figs. 5 and 6. Hiniker Air Seeder Cart at Photo 4. ADC2220 at 7-1 (No. 18).
Claim 26	
The seed or grain tender of claim 20, wherein said first vertical axis extends through said base.	Sawby '216 at col. 2, ll. 40-42 and Figure. Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7. Deboffles '667 at Figs. 1-4 (vertical axis X-X). Hiniker Air Seeder Cart at Photo 3.

Claim 27	
The seed or grain tender of claim 20, wherein said second end of said support arm terminates at or near said approximate center of gravity of said conveyor.	Meharry '483 at Figs. 2 and 3. Sawby '216 at col. 2, ll. 44-47 and Figure. Forsyth '556 at col. 7, ll. 12-14. Baskerville '044 at Figs. 5 and 9. Meyer '814 at Fig. 2. Hundeby '677 at Figs. 5 and 6. Deboffles '667 at Figs. 1-4. Hiniker Air Seeder Cart at Photos 1, 7, and 8. ADC2220 at 7-1.
Claim 28	
The seed or grain tender of claim 20, wherein said first end of said support arm is fixed at a first height and said second end of said support arm is pivotable between a range of heights.	Sawby '216 at col. 2, ll. 32-34 and Figure. Forsyth '556 at col. 7, ll. 6-10 and 56-63 and Figs. 4 and 8. Baskerville '044 at col. 5, ll. 6-16 and Figs. 4-5. Hiniker Air Seeder Cart at Photos 1, 2, 6, and 7.

Claim 29	
The seed or grain tender of claim 20, wherein said lift device is a pressurized cylinder.	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder).
Claim 30	
The seed or grain tender of claim 20, wherein said lift device is a hydraulic cylinder.	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder).
Claim 34	
The seed or grain tender of claim 20, wherein said internal elevator includes a motor-driven belt.	Forsyth '556 at col. 4, l. 68 (motor 75). Baskerville '044 at col. 4, ll. 13, 45, and 49 (conveyor 31, belt 55, and motor 58). Meyer '814 at col. 2, ll. 43-44 and 50 (conveyor 32, belt, and motor 38). Furrer '817 at col. 3, l. 43 (conveyor 11) and col. 4, ll. 29-31 (belt and motor 30) and Fig. 3.

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Claim 1	References
A seed or grain tender comprising:	Meharry '483 at col. 2, l. 35 (gravity bed vehicle 10). Sawby '216 at col. 2, ll. 8-10 (grain handling apparatus 1). Forsyth '556 at col. 4, ll. 15-17. Baskerville '044 at col. 3, l. 53 (seed cart 1). Meyer '814 at col. 2, l. 31 (cart 10). Furrer '817 at col. 3, ll. 41-42 (seed tender). Hundeby '677 at pg. 4 (cart 1). Deboffles '667 at Figs. 1-4 (No. 1). Hiniker Air Seeder Cart at Photo 1. ADC2220 at Cover page.

a frame;	Meharry '483 at Figs. 1-3 (frame 20). Forsyth '556 at col. 4, l. 45 (frame 18). Baskerville '044 at col. 3, l. 55 (lower frame 2). Meyer '814 at col. 2, l. 37 (frame 12). Furrer '817 at col. 4, ll. 5-6 (frame 22). Hundeby '677 at Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 2). Hiniker Air Seeder Cart at Photos 1-3. ADC2220 at 2-1 (No. 1).

a main hopper mounted on said frame and having a main hopper discharge;	Meharry '483 at col. 2, ll. 39 and 46 (gravity bed 21 and opening 12). Sawby '216 at col. 2, ll. 11-12 (grain bins or hopper 2); col. 3, l. 20 (outlet 36). Forsyth '556 at col. 4, l. 29 (compartment 6) and col. 5, l. 20 (ports). Baskerville '044 at col. 3, l. 58 (grain bin 11) and col. 4, ll. 3-4 (discharge opening 25). Meyer '814 at col. 2, l. 34 (first and second tanks 14, 16); col. 2, l. 36 (outlet 20). Furrer '817 at col. 3, ll. 45-46 (seed storage bin 13) and col.4, l. 66–col. 5, l. 4 and Fig. 1A. Hundeby '677 at pg. 4 (tanks 2 and discharge 21) and Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 4). Hiniker Air Seeder Cart at Photos 1-3 and 5. ADC2220 at 2-11 and 2-13 (Nos. 5 and 6).
a base mounted below said main hopper discharge;	Sawby '216 at col. 2, l. 17 (base plate 6). Furrer '817 at col. 4, l. 26 (turret mount 28). Deboffles '667 at Figs. 1-4 (lower end of No. 2). Hiniker Air Seeder Cart at Photos 1 and 3.

a support arm having first and second ends;	Meharry '483 at col. 3, l. 8 and Figs. 1-3 (arm 41). Sawby '216 at col. 2, l. 25 (boom 10). Forsyth '556 at col. 4, l. 24 and Figs. 1 and 2 (crane 16) and col. 7, l. 48 (crane assembly 116) and Fig. 8. Baskerville '044 at col. 4, l. 43 (boom 53). Meyer '814 at col. 2, l. 55 (first arm 40). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder). Hundeby '677 at Figs. 1, 5, and 6 (unnumbered diagonal member supporting No. 15, as shown in Fig. 5). Deboffles '667 at Figs. 1-4 (Nos. 6 and 7). Hiniker Air Seeder Cart at Photos 1-4. ADC2220 at 7-1 (Nos. 15 and 20).

a first coupling connecting said first end of said support arm with said base, said first coupling being rotatable in relation to said base about a first vertical axis of rotation, and said first end of said support arm being rotatable in relation to said first coupling about a first horizontal axis of rotation;	Sawby '216 at col. 2, l. 17 and Figure (sleeve 7). Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7. Deboffles '667 at Figs. 1-4 (vertical axis X-X). Hiniker Air Seeder Cart at Photos 2 and 3. Other prior showing a first coupling: Meharry '483 at col. 3, l. 12 and Figs. 1-3 (tubular member 45). Forsyth '556 at col. 7, l. 3 and Figs. 1, 2, and 4 (vertical bar 42) and col. 7, l. 33 (first pivot bracket 119) and Fig. 8. Baskerville '044 at col. 4, l. 54 (tube 61). Meyer '814 at col. 2, l. 55 ("first arm 40 is pivotally coupled with frame 12") and Figs. 2 and 3. ADC2220 at 7-1 (structural member (dashed line) to which support arm 20 connects to via shaft 21).

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, a conveyor discharge at said second end, and an internal elevator for moving seed or grain from said conveyor hopper to said conveyor discharge; and	Meharry '483 at col. 2, l. 50 (auger arrangement 25). Sawby '216 at col. 2, ll. 48-49 ("The auger . . . includes the casing 17 . . .") and Figure. Forsyth '556 at col. 4, l. 21 (conveyor 10) and col. 7, l. 19 (belt 74). Baskerville '044 at col. 4, ll. 13 and 45 (conveyor 31 and belt 55). Meyer '814 at col. 2, ll. 43-44 (conveyor 32 and belt). Furrer '817 at col. 3, l. 43 (conveyor 11) and col. 4, ll. 29-31 (belt) and Fig. 3. Hundeby '677 at pg. 4 (auger 15, inlet 16, and discharge 17) and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (No. 8). Hiniker Air Seeder Cart at Photo 1. ADC2220 at 7-1 and 8-1.

a second coupling connecting said second end of said support arm with said conveyor at an approximate center of gravity of said conveyor, said second coupling defining a second vertical axis of rotation that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable in relation to said second end of said support arm about said second vertical axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper.	Meharry '483 at col. 3, l. 20 (line 51) and col. 1, ll. 11-18 and Figs. 2 and 3. Sawby '216 at col. 2, l. 35 (bracket 16) and col. 3, ll. 4-25 and Figure. Forsyth '556 at col. 7, ll. 11-14 and col. 8, ll. 11-49 and Figs. 1, 2, and 4. Meyer '814 at col. 2, ll. 45-47 and 58 (second arm 42). Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (vertical axis Z-Z). Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1 (the various components at the end of support arm 15, e.g., No. 18); ADC2220 Publication at 14 ("Dual purpose design allows you to load and unload with the same auger.").
Claim 2	
The seed or grain tender of claim 1, wherein said first vertical axis of rotation extends through said main hopper discharge.	Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7.

Claim 3	
The seed or grain tender of claim 1, wherein said second vertical axis of rotation extends through said approximate center of gravity of said conveyor.	Meharry '483 at Fig. 2. Sawby '216 at Figure. Forsyth '556 at col. 7, ll. 12-14. Meyer '814 at Figs. 2-4. Hundeby '677 at Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (vertical axis Z-Z). Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1.
Claim 5	
The seed or grain tender of claim 1, wherein said second end of said support arm terminates at or near said second coupling.	Meharry '483 at Fig. 2. Sawby '216 at col. 2, ll. 44-47 and Figure. Forsyth '556 at col. 7, ll. 12-14 and Fig. 4. Baskerville '044 at Figs. 4 and 5. Meyer '814 at Figs. 2 and 3. Deboffles '667 at Figs. 1-4. Hiniker Air Seeder Cart at Photos 1 and 4. ADC2220 at 7-1.

Claim 6	
The seed or grain tender of claim 1, further comprising a hydraulic piston extending at an acute angle relative to a horizontal plane to connect with a portion of said support arm spaced from said first horizontal axis of rotation.	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder).
Claim 7	
The seed or grain tender of claim 1, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.	Meharry '483 at col. 3, l. 4 (stand 40).

Claim 8	
A seed or grain tender comprising:	Meharry '483 at col. 2, l. 35 (gravity bed vehicle 10). Sawby '216 at col. 2, ll. 8-10 (grain handling apparatus 1). Forsyth '556 at col. 4, ll. 15-17. Baskerville '044 at col. 3, l. 53 (seed cart 1). Meyer '814 at col. 2, l. 31 (cart 10). Furrer '817 at col. 3, ll. 41-42 (seed tender). Hundeby '677 at pg. 4 (cart 1). Deboffles '667 at Figs. 1-4 (No. 1). Hiniker Air Seeder Cart at Photo 1. ADC2220 at Cover page.

a frame;	Meharry '483 at Figs. 1-3 (frame 20). Forsyth '556 at col. 4, l. 45 (frame 18). Baskerville '044 at col. 3, l. 55 (lower frame 2). Meyer '814 at col. 2, l. 37 (frame 12). Furrer '817 at col. 4, ll. 5-6 (frame 22). Hundeby '677 at Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 2). Hiniker Air Seeder Cart at Photos 1-3. ADC2220 at 2-1 (No. 1).

a main hopper mounted on said frame and having a main hopper discharge;	Meharry '483 at col. 2, ll. 39 and 46 (gravity bed 21 and opening 12). Sawby '216 at col. 2, ll. 11-12 (grain bins or hopper 2); col. 3, l. 20 (outlet 36). Forsyth '556 at col. 4, l. 29 (compartment 6) and col. 5, l. 20 (ports). Baskerville '044 at col. 3, l. 58 (grain bin 11) and col. 4, ll. 3-4 (discharge opening 25). Meyer '814 at col. 2, l. 34 (first and second tanks 14, 16); col. 2, l. 36 (outlet 20). Furrer '817 at col. 3, ll. 45-46 (seed storage bin 13) and col.4, l. 66–col. 5, l. 4 and Fig. 1A. Hundeby '677 at pg. 4 (tanks 2 and discharge 21) and Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 4). Hiniker Air Seeder Cart at Photos 1-3 and 5. ADC2220 at 2-11 and 2-13 (Nos. 5 and 6).
a base positioned below said main hopper;	Sawby '216 at col. 2, l. 17 (base plate 6). Furrer '817 at col. 4, l. 26 (turret mount 28). Deboffles '667 at Figs. 1-4 (lower end of No. 2). Hiniker Air Seeder Cart at Photos 1 and 3.

a support arm having first and second ends;	Meharry '483 at col. 3, l. 8 and Figs. 1-3 (arm 41). Sawby '216 at col. 2, l. 25 (boom 10). Forsyth '556 at col. 4, l. 24 and Figs. 1 and 2 (crane 16) and col. 7, l. 48 (crane assembly 116) and Fig. 8. Baskerville '044 at col. 4, l. 43 (boom 53). Meyer '814 at col. 2, l. 55 (first arm 40). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder). Hundeby '677 at Figs. 1, 5, and 6 (unnumbered diagonal member supporting No. 15, as shown in Fig. 5). Deboffles '667 at Figs. 1-4 (Nos. 6 and 7). Hiniker Air Seeder Cart at Photos 1-4. ADC2220 at 7-1(Nos. 15 and 20).

a first coupling connecting said first end of said support arm with said base, said first coupling being rotatable about a first vertical axis of rotation, and said first end of said support arm being rotatable about a first horizontal axis of rotation;	Sawby '216 at col. 2, l. 17 and Figure (sleeve 7). Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7. Deboffles '667 at Figs. 1-4 (vertical axis X-X). Hiniker Air Seeder Cart at Photos 2 and 3. Other prior showing a first coupling: Meharry '483 at col. 3, l. 12 and Figs. 1-3 (tubular member 45). Forsyth '556 at col. 7, l. 3 and Figs. 1, 2, and 4 (vertical bar 42) and col. 7, l. 33 (first pivot bracket 119) and Fig. 8. Baskerville '044 at col. 4, l. 54 (tube 61). Meyer '814 at col. 2, l. 55 ("first arm 40 is pivotally coupled with frame 12") and Figs. 2 and 3. ADC2220 at 7-1 (structural member (dashed line) to which support arm 20 connects to via shaft 21).

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, and a conveyor discharge at said second end; and	Meharry '483 at col. 2, l. 50 (auger arrangement 25). Sawby '216 at col. 2, ll. 48-49 ("The auger . . . includes the casing 17 . . .") and Figure. Forsyth '556 at col. 4, l. 21 (conveyor 10). Baskerville '044 at col. 4, l. 13 (conveyor 31). Meyer '814 at col. 2, l. 43 (conveyor 32). Furrer '817 at col. 3, l. 43 (conveyor 11) and Fig. 3. Hundeby '677 at pg. 4 (auger 15, inlet 16, and discharge 17) and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (No. 8). Hiniker Air Seeder Cart at Photo 1. ADC2220 at 7-1 and 8-1.

a second coupling connecting said second end of said support arm with said conveyor at an approximate center of gravity of said conveyor, said second coupling defining a second vertical axis of rotation that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable about said second vertical axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper.	Meharry '483 at col. 3, l. 20 (line 51) and col. 1, ll. 11-18 and Figs. 2 and 3. Sawby '216 at col. 2, l. 35 (bracket 16) and col. 3, ll. 4-25 and Figure. Forsyth '556 at col. 7, ll. 11-14 and col. 8, ll. 11-49 and Figs. 1, 2, and 4. Meyer '814 at col. 2, ll. 45-47 and 58 (second arm 42). Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (vertical axis Z-Z). Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1 (the various components at the end of support arm 15, e.g., No. 18); ADC2220 Publication at 14 ("Dual purpose design allows you to load and unload with the same auger.").
Claim 9	
The seed or grain tender of claim 8, wherein said first vertical axis of rotation extends through said main hopper discharge.	Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7.

Claim 10	
The seed or grain tender of claim 8, wherein said second vertical axis of rotation extends through said approximate center of gravity of said conveyor.	Meharry '483 at Fig. 2. Sawby '216 at Figure. Forsyth '556 at col. 7, ll. 12-14. Meyer '814 at Figs. 2 and 3. Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (vertical axis Z-Z). Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1.

Claim 12	
The seed or grain tender of claim 8, wherein said second end of said support arm terminates at or near said second coupling.	Meharry '483 at Fig. 2. Sawby '216 at col. 2, ll. 44-47 and Figure. Forsyth '556 at col. 7, ll. 12-14 and Fig. 4. Baskerville '044 at Figs. 4 and 5. Meyer '814 at col. 2, ll. 43-44 (conveyor 32 and belt). Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4. Hiniker Air Seeder Cart at Photos 1 and 4. ADC2220 at 7-1.
Claim 13	
The seed or grain tender of claim 8, wherein said conveyor includes an internal elevator for moving seed or grain from said conveyor hopper to said conveyor discharge.	Forsyth '556 at col. 7, l. 19 (belt 74). Baskerville '044 at col. 4, ll. 13 and 45 (conveyor 31 and belt 55). Meyer '814 at col. 2, ll. 43-44 (conveyor 32 and belt). Furrer '817 at col. 3, l. 43 (conveyor 11) and col. 4, ll. 29-31 (belt) and Fig. 3.

Claim 14	Accused Instrumentalities
The seed or grain tender of claim 8, further comprising a hydraulic piston extending at an acute angle relative to a horizontal plane to connect with a portion of said support arm spaced from said first horizontal axis of rotation.	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder).
Claim 15	
The seed or grain tender of claim 8, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.	Meharry '483 at col. 3, l. 4 (stand 40).

Claim 16	
A seed or grain tender comprising:	Meharry '483 at col. 2, l. 35 (gravity bed vehicle 10). Sawby '216 at col. 2, ll. 8-10 (grain handling apparatus 1). Forsyth '556 at col. 4, ll. 15-17. Baskerville '044 at col. 3, l. 53 (seed cart 1). Meyer '814 at col. 2, l. 31 (cart 10). Furrer '817 at col. 3, ll. 41-42 (seed tender). Hundeby '677 at pg. 4 (cart 1). Deboffles '667 at Figs. 1-4 (No. 1). Hiniker Air Seeder Cart at Photo 1. ADC2220 at Cover page.

a main hopper having a main hopper discharge;	Meharry '483 at col. 2, ll. 39 and 46 (gravity bed 21 and opening 12). Sawby '216 at col. 2, ll. 11-12 (grain bins or hopper 2); col. 3, l. 20 (outlet 36). Forsyth '556 at col. 4, l. 29 (compartment 6) and col. 5, l. 20 (ports). Baskerville '044 at col. 3, l. 58 (grain bin 11) and col. 4, ll. 3-4 (discharge opening 25). Meyer '814 at col. 2, l. 34 (first and second tanks 14, 16); col. 2, l. 36 (outlet 20). Furrer '817 at col. 3, ll. 45-46 (seed storage bin 13) and col.4, l. 66–col. 5, l. 4 and Fig. 1A. Hundeby '677 at pg. 4 (tanks 2 and discharge 21) and Figs. 1, 5, and 6. Deboffles '667 at Figs. 1-4 (No. 4). Hiniker Air Seeder Cart at Photos 1-3 and 5. ADC2220 at 2-11 and 2-13 (Nos. 5 and 6).
a base positioned below said main hopper;	Sawby '216 at col. 2, l. 17 (base plate 6). Furrer '817 at col. 4, l. 26 (turret mount 28). Deboffles '667 at Figs. 1-4 (lower end of No. 2). Hiniker Air Seeder Cart at Photos 1 and 3.

a support arm having first and second ends;	Meharry '483 at col. 3, l. 8 and Figs. 1-3 (arm 41). Sawby '216 at col. 2, l. 25 (boom 10). Forsyth '556 at col. 4, l. 24 and Figs. 1 and 2 (crane 16) and col. 7, l. 48 (crane assembly 116) and Fig. 8. Baskerville '044 at col. 4, l. 43 (boom 53). Meyer '814 at col. 2, l. 55 (first arm 40). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder). Hundeby '677 at Figs. 1, 5, and 6 (unnumbered diagonal member supporting No. 15, as shown in Fig. 5). Deboffles '667 at Figs. 1-4 (Nos. 6 and 7). Hiniker Air Seeder Cart at Photos 1-4. ADC2220 at 7-1(Nos. 15 and 20).

first coupling connecting said first end of said support arm with said base, said first coupling being rotatable about a first vertical axis of rotation, and said first end of said support arm being rotatable about a first horizontal axis of rotation;	Sawby '216 at col. 2, l. 17 and Figure (sleeve 7). Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7. Deboffles '667 at Figs. 1-4 (vertical axis X-X). Hiniker Air Seeder Cart at Photos 2 and 3. Other prior showing a first coupling: Meharry '483 at col. 3, l. 12 and Figs. 1-3 (tubular member 45). Forsyth '556 at col. 7, l. 3 and Figs. 1, 2, and 4 (vertical bar 42) and col. 7, l. 33 (first pivot bracket 119) and Fig. 8. Baskerville '044 at col. 4, l. 54 (tube 61). Meyer '814 at col. 2, l. 55 ("first arm 40 is pivotally coupled with frame 12") and Figs. 2 and 3. ADC2220 at 7-1 (structural member (dashed line) to which support arm 20 connects to via shaft 21).

a conveyor having a longitudinal axis and first and second ends, a conveyor hopper at said first end, and a conveyor discharge at said second end; and	Meharry '483 at col. 2, l. 50 (auger arrangement 25). Sawby '216 at col. 2, ll. 48-49 ("The auger . . . includes the casing 17 . . .") and Figure. Forsyth '556 at col. 4, l. 21 (conveyor 10). Baskerville '044 at col. 4, l. 13 (conveyor 31). Meyer '814 at col. 2, l. 43 (conveyor 32). Furrer '817 at col. 3, l. 43 (conveyor 11) and Fig. 3. Hundeby '677 at pg. 4 (auger 15, inlet 16, and discharge 17) and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (No. 8). Hiniker Air Seeder Cart at Photo 1. ADC2220 at 7-1 and 8-1.

a second coupling connecting said second end of said support arm with said conveyor at an approximate center of gravity of said conveyor, said second coupling defining a first conveyor axis of rotation that is not parallel to said conveyor longitudinal axis, and said conveyor being rotatable about said first conveyor axis of rotation between an unloading position wherein said conveyor hopper is disposed below said main hopper discharge to receive agricultural product from said main hopper and a loading position wherein said conveyor discharge is disposed above said main hopper to dispense agricultural product into said main hopper.	Meharry '483 at col. 3, l. 20 (line 51) and col. 1, ll. 11-18 and Figs. 2 and 3. Sawby '216 at col. 2, l. 35 (bracket 16) and col. 3, ll. 4-25 and Figure. Forsyth '556 at col. 7, ll. 11-14 and col. 8, ll. 11-49 and Figs. 1, 2, and 4. Meyer '814 at col. 2, ll. 45-47 and 58 (second arm 42). Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (vertical axis Z-Z). Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1 (the various components at the end of support arm 15, e.g., No. 18); ADC2220 Publication at 14 ("Dual purpose design allows you to load and unload with the same auger.").
Claim 17	
The seed or grain tender of claim 16, wherein said first vertical axis of rotation extends through said main hopper discharge.	Furrer '817 at col. 4, ll. 43-53 and Figs. 1A, 2, 5, and 7.

Claim 18	
The seed or grain tender of claim 16, wherein said first conveyor axis of rotation extends through said approximate center of gravity of said conveyor.	Meharry '483 at Fig. 2. Sawby '216 at Figure. Forsyth '556 at col. 7, ll. 12-14. Meyer '814 at Figs. 2 and 3. Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4 (vertical axis Z-Z). Hiniker Air Seeder Cart at Photos 1, 4, 6, and 7. ADC2220 at 7-1.

Claim 20	
The seed or grain tender of claim 16, wherein said second end of said support arm terminates at or near said second coupling.	Meharry '483 at Fig. 2. Sawby '216 at col. 2, ll. 44-47 and Figure. Forsyth '556 at col. 7, ll. 12-14 and Fig. 4. Baskerville '044 at Figs. 4 and 5. Meyer '814 at Figs. 2 and 3. Hundeby '677 at Abstract and Figs. 5 and 6. Deboffles '667 at Figs. 1-4. Hiniker Air Seeder Cart at Photos 1 and 4. ADC2220 at 7-1.
Claim 21	
The seed or grain tender of claim 16, wherein said conveyor includes an internal elevator for moving seed or grain from said conveyor hopper to said conveyor discharge.	Forsyth '556 at col. 7, l. 19 (belt 74). Baskerville '044 at col. 4, ll. 13 and 45 (conveyor 31 and belt 55). Meyer '814 at col. 2, ll. 43-44 (conveyor 32 and belt). Furrer '817 at col. 3, l. 43 (conveyor 11) and col. 4, ll. 29-31 (belt) and Fig. 3.

Claim 22	
The seed or grain tender of claim 16, further comprising a hydraulic piston extending at an acute angle relative to a horizontal plane to connect with a portion of said support arm spaced from said first horizontal axis of rotation.	Sawby '216 at col. 2, l. 30 (hydraulic cylinder 13). Forsyth '556 at col. 7, ll. 10 (cylinder 34) and 59 (hydraulic ram 109). Baskerville '044 at col. 4, l. 56 (hydraulic lifting cylinder 64). Furrer '817 at Figs. 1A, 2, 5, and 7 (hydraulic cylinder).
Claim 23	
The seed or grain tender of claim 16, further comprising a stand coupled with said first end of said conveyor and movable between a stowed position allowing said conveyor hopper to be positioned below said main hopper discharge when said conveyor is in said unloading position and an extended position supporting said conveyor hopper above the ground when said conveyor is in said loading position.	Meharry '483 at col. 3, l. 4 (stand 40).

Electronic Patent Application Fee Transmittal	
Application Number:	14606794
Filing Date:	27-Jan-2015
Title of Invention:	SEED CARRIER WITH PIVOTING CONVEYOR
First Named Inventor/Applicant Name:	Brian James PETERSEN
Filer:	George R. Repper/Marilyn Davis
Attorney Docket Number:	1994-363US2
Filed as Large Entity	
Filing Fees for Utility under 35 USC 111(a)	

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Transaction History Date 2017-07-06
Date information retrieved from USPTO Patent Application Information Retrieval (PAIR) system records at www.uspto.gov

Notice of Allowability	Application No. 14/606,794	Applicant(s) PETERSEN ET AL.	
	Examiner WILLIE BERRY JR	Art Unit 3652	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *4/26/17*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *39-46 and 48-60*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   Certified copies:
   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____.
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/SAUL RODRIGUEZ/
Supervisory Patent Examiner, Art Unit 3652

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14606794
	Filing Date	2015-01-27
	First Named Inventor	Brian James PETERSEN
	Art Unit	3652
	Examiner Name	Willie Wendell Berry Jr.
	Attorney Docket Number	1994-363.US2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/George R. Repper/	Date (YYYY-MM-DD)	2017-04-26
Name/Print	George R. Repper	Registration Number	31,414

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Receipt date: 04/26/2017 14606794 - GAU: 3652

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	14606794
Filing Date	2015-01-27
First Named Inventor	Brian James PETERSEN
Art Unit	3652
Examiner Name	Willie Wendell Berry Jr.
Attorney Docket Number	1994-363.US2

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	1	2465667	FR	A1	1981-03-27	DEBOFFLES, Regis		X
	2	2416677	CA	A1	2004-08-13	HUNDEBY, David R.		☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	14606794
Filing Date	2015-01-27
First Named Inventor	Brian James PETERSEN
Art Unit	3652
Examiner Name	Willie Wendell Berry Jr.
Attorney Docket Number	1994-363.US2

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Hiniker Company, Model 4836 Air Seeder Cart with 4800 Air Drill Front Folding Toolbar, Operator's Manual, January 1999, 58 pages.	
	2	Hiniker Company, Models 4831, 4832, and 4833 Air Seeder Cart with 4800 Air Seeder Front Folding Toolbar, Assembly Manual, January 2000, 49 pages.	
	3	Hiniker 4831, 4832, 4833 Air Seeder, July 21, 1999, 1 page.	
	4	Hiniker Company, Fill Auger Support Assembly, 1 page.	
	5	Hiniker Company, 4800 Soybean Planter Marketing Material, 6 pages.	
	6	Hiniker Company, Product Photographs, 67 pages.	
	7	J&M Manufacturing Company, Inc., Annotated Photographs of Hiniker Company 4836 Air Seed Cart, 8 pages.	
	8	Great Plains Manufacturing, 220 Bushel Air Cart, 2 pages.	
	9	J&M Manufacturing Company, Inc., J&M Mfg. Co., Inc.'s Amended Initial Invalidity Contentions submitted in Unverferth Mfg. Co., Inc. v. J&M Mfg. Co., Inc., Civil Action No. 3:16-cv-02282-JZ (N.D. Ohio), February 7, 2017, 59 pages.	

If you wish to add additional non-patent literature document citation information please click the Add button Add

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14606794
	Filing Date	2015-01-27
	First Named Inventor	Brian James PETERSEN
	Art Unit	3652
	Examiner Name	Willie Wendell Berry Jr.
	Attorney Docket Number	1994-363.US2

EXAMINER SIGNATURE			
Examiner Signature	/WILLIE W BERRY JR/	Date Considered	06/26/2017

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

6449 7590 07/06/2017
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

EXAMINER	
BERRY JR, WILLIE WENDELL	
ART UNIT	PAPER NUMBER
3652	

DATE MAILED: 07/06/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/606,794	01/27/2015	Brian James PETERSEN	1994-363US2	1047

TITLE OF INVENTION: SEED CARRIER WITH PIVOTING CONVEYOR

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	10/06/2017

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 02/11)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

6449 7590 07/06/2017
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/606,794	01/27/2015	Brian James PETERSEN	1994-363US2	1047

TITLE OF INVENTION: SEED CARRIER WITH PIVOTING CONVEYOR

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	10/06/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
BERRY JR, WILLIE WENDELL	3652	414-523000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____ 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/606,794	01/27/2015	Brian James PETERSEN	1994-363US2	1047

6449 7590 07/06/2017
ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

EXAMINER	
BERRY JR, WILLIE WENDELL	

ART UNIT	PAPER NUMBER
3652	

DATE MAILED: 07/06/2017

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt	
EFS ID:	29773311
Application Number:	14606794
International Application Number:	
Confirmation Number:	1047
Title of Invention:	SEED CARRIER WITH PIVOTING CONVEYOR
First Named Inventor/Applicant Name:	Brian James PETERSEN
Customer Number:	6449
Filer:	George R. Repper/Cindy Brooks
Filer Authorized By:	George R. Repper
Attorney Docket Number:	1994-363US2
Receipt Date:	13-JUL-2017
Filing Date:	27-JAN-2015
Time Stamp:	14:37:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$960
RAM confirmation Number	071417INTEFSW00000882022135
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Issue_Fee_1994-362-US2.pdf	133883	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30555	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	164438		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
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Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

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6449 7590 07/06/2017
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WASHINGTON, DC 20005

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Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/606,794	01/27/2015	Brian James PETERSEN	1994-363US2	1047

TITLE OF INVENTION: SEED CARRIER WITH PIVOTING CONVEYOR

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	10/06/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
BERRY JR, WILLIE WENDELL	3652	414-523000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 Rothwell, Figg, Ernst & Manbeck, P.C.
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: UNVERFERTH MANUFACTURING COMPANY, INC.
(B) RESIDENCE: (CITY and STATE OR COUNTRY): Kalida, OH

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 02-2135 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
☐ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
☐ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /George R. Repper/ Date July 13, 2017
Typed or printed name George R. Repper Registration No. 31,414

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Electronic Patent Application Fee Transmittal

Application Number:	14606794
Filing Date:	27-Jan-2015
Title of Invention:	SEED CARRIER WITH PIVOTING CONVEYOR
First Named Inventor/Applicant Name:	Brian James PETERSEN
Filer:	George R. Repper/Cindy Brooks
Attorney Docket Number:	1994-363US2

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	960

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/606,794	08/29/2017	9745123	1994-363US2	1047

6449 7590 08/09/2017

ROTHWELL, FIGG, ERNST & MANBECK, P.C.
607 14th Street, N.W.
SUITE 800
WASHINGTON, DC 20005

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 305 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Brian James PETERSEN, Ottawa, OH;
UNVERFERTH MANUFACTURING COMPANY, INC., Kalida, OH;
David Richard SMITH, Fort Jennings, OH;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the District of North Dakota on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
3:18-cv-053	3/12/2018	for the District of North Dakota

PLAINTIFF	DEFENDANT
Unverferth Mfg. Co., Inc.	Norwood Sales Inc.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	8,221,047	7/17/2012	Unverferth Mfg. Co., Inc.
2	8,967,940	3/3/2015	Unverferth Mfg. Co., Inc.
3	9,745,123	8/29/2017	Unverferth Mfg. Co., Inc.
4			
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
Robert Ansley	/s/ Ashley Sanders	3/12/2018

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Northern District of Iowa on the following

G Trademarks or ☑ Patents. (G the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
5:19-cv-4005	1/23/2019	Northern District of Iowa

PLAINTIFF	DEFENDANT
Unverferth Mfg. Co., Inc.	Meridian Mfg., Inc.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	8,221,047	7/17/2012	Unverferth
2	8,967,940	3/3/2015	Unverferth
3	9,745,123	8/29/2017	Unverferth
4			
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY G Amendment G Answer G Cross Bill G Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
Robert L. Phelps, Clerk of Court	/s/Paul A. Coberly, Deputy Clerk	1/24/2019

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

File History Content Report

The following content is missing from the original file history record obtained from the United States Patent and Trademark Office. No additional information is available.

Document Date - 2021-02-18

Document Title - Applicant Communication Re: Payment of Maintenance Fee, 4th Year, Large Entity

This page is not part of the official USPTO record. It has been determined that content identified on this document is missing from the original file history record.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/606,794	Filing Date 01/27/2015	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 = *		X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 = *		X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	05/11/2015	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 22	Minus	** 38	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SLIE
/HELENA PAYTON/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/606,794

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	38 minus 20=	* 18			OR	x 80 =	1440
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	3040

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/606,794

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	38 minus 20=	* 18			OR	x 80 =	1440
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	3040

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/606,794	Filing Date 01/27/2015	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	38 minus 20 =	* 18	x $80 =	1440
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	* 0	x $420 =	0
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	1440

APPLICATION AS AMENDED – PART II

AMENDMENT	04/26/2017	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 38	= 0	x $80 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	x $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
GERALDINE STANLEY

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Derwent Innovation Patent Export, 2024-08-29 00:40:36 +0000

Search results for: PNS=(US9745123);
Collections searched: DWPI; ARIPO grant; Argentina UM; Argentina app; Armenia grant; Australia UM; Australia app; Australia grant; Austria UM; Austria app; Austria grant; Belarus UM; Belarus grant; Belgium app; Belgium grant; Brazil UM; Brazil app; Brazil grant; Bulgaria UM; Bulgaria app; Bulgaria grant; Canada app; Canada grant; China, Mainland UM; China, Mainland app; China, Mainland grant; Colombia app; Costa Rica UM; Costa Rica app; Croatia UM; Croatia app; Croatia grant; Cuba app; Cuba grant; Czech Republic UM; Czech Republic app; Czech Republic grant; Czechoslovakia grant; Denmark UM; Denmark app; Denmark grant; Estonia UM; Estonia app; Estonia grant; Eurasian (EAPO) grant; Europe (EP) app; Europe (EP) grant; Finland app; Finland grant; France app; France grant; Georgia grant; German Democratic Republic app; German Democratic Republic grant; Germany UM; Germany app; Germany grant; Greece app; Greece grant; Gulf Cooperation Council grant; Hong Kong UM; Hong Kong app; Hong Kong grant; Hungary grant; Iceland grant; India app; India grant; Indonesia UM; Indonesia app; Ireland UM; Ireland app; Ireland grant; Israel grant; Italy grant; Italy grant; Italy grant; Italy grant; Japan UM; Japan app; Japan grant; Korea UM; Korea app; Korea grant; Latvia grant; Lithuania grant; Luxembourgh app; Luxembourgh grant; Malaysia app; Malaysia grant; Mexico app; Mexico grant; Moldova UM; Moldova grant; Monaco grant; Mongolia UM; Mongolia grant; Morocco app; Morocco grant; Netherlands app; Netherlands grant; New Zealand grant; Norway app; Norway grant; OAPI grant; PCT (WO) app; Philippines UM; Philippines app; Philippines grant; Poland UM; Poland grant; Portugal UM; Portugal app; Portugal grant; Romania UM; Romania app; Romania granted; Russia UM; Russia app; Russia grant; Saudi Arabia app; Saudi Arabia grant; Serbia UM; Serbia app; Serbia grant; Singapore app; Singapore grant; Slovakia UM; Slovakia app; Slovakia grant; Slovenia UM; Slovenia grant; South Africa app; Spain UM; Spain app; Spain grant; Sweden app; Sweden grant; Switzerland app; Switzerland grant; Taiwan UM; Taiwan appl; Taiwan grant; Thailand UM; Thailand app; Thailand grant; Tunisia app; Turkey UM; Turkey app; UK app; UK grant; USSR grant; Ukraine UM; Ukraine grant; United States app; United States grant; Uruguay app; Vietnam UM; Vietnam app; Vietnam grant; Other

Table of Contents

1. US9745123B2 Seed carrier with pivoting conveyor

Family 1/1

1 record(s) per family

Record 1/1 US9745123B2 Seed carrier with pivoting conveyor

Title: Seed carrier with pivoting conveyor

Title - DWPI: Agricultural seed or grain tender for moving e.g. grain, has conveyor hopper arranged below main hopper to receive agricultural product, and conveyor discharge placed above main hopper to dispense agricultural product into main hopper

Priority Number: US2007901321P | US200831867A | US13541553A

Priority Date: 2007-02-15 | 2008-02-15 | 2012-07-03

Application Number: US14606794A

Application Date: 2015-01-27

Publication Date: 2017-08-29

IPC Class Table:

IPC	Section	Class	Subclass	Class Group	Subgroup
B65F000100	B	B65	B65F	B65F0001	B65F000100
A01C001500	A	A01	A01C	A01C0015	A01C001500
B60P000136	B	B60	B60P	B60P0001	B60P000136
B65D008854	B	B65	B65D	B65D0088	B65D008854
B65G006532	B	B65	B65G	B65G0065	B65G006532
B65G006540	B	B65	B65G	B65G0065	B65G006540
B65G006542	B	B65	B65G	B65G0065	B65G006542
B60P000100	B	B60	B60P	B60P0001	B60P000100

IPC Class Table - DWPI:

IPC - DWPI	Section - DWPI	Class - DWPI	Subclass - DWPI	Class Group - DWPI	Subgroup - DWPI
A01C001500	A	A01	A01C	A01C0015	A01C001500
B60P000136	B	B60	B60P	B60P0001	B60P000136
B65D008854	B	B65	B65D	B65D0088	B65D008854
B65F000100	B	B65	B65F	B65F0001	B65F000100

B65G006532	B	B65	B65G	B65G0065	B65G006532
B65G006540	B	B65	B65G	B65G0065	B65G006540
B65G006542	B	B65	B65G	B65G0065	B65G006542
B60P000100	B	B60	B60P	B60P0001	B60P000100

Assignee/Applicant: UNVERFERTH MANUFACTURING COMPANY INC.,Kalida,OH,US

JP F Terms:

JP FI Codes:

Assignee - Original: UNVERFERTH MANUFACTURING COMPANY INC.

Any CPC Table:

Type	CPC - Current - Invention	CPC - Current - Additional	Version	Office
Current Current	**B65D 88/54** A01D 90/10	B60P 1/00	20130101 20130101	US US
Current Current	A01C 15/003 A01C 15/006	-	20130101 20130101	EP EP
Original Original Original Original Original Original Original	**B65D 88/54** A01C 15/003 A01C 15/006 B60P 1/36 B65G 65/32 B65G 65/40 B65G 65/42	B60P 1/00	20130101 20130101 20130101 20130101 20130101 20130101 20130101	US US US US US US US

ECLA:

Abstract:

A seed carrier includes a main hopper coupled with a frame via leg members. The main hopper has a discharge. A base plate is coupled with the frame. A support arm is rotatably coupled with the base plate at a first end. A belt driven conveyor having a conveyor hopper at a first end and a discharge at a second end is rotatably coupled with a second end of the support arm at an approximate center of gravity thereof. A latch mechanism is provided for detachably coupling the first end of the conveyor with the first end of the support arm such that the conveyor hopper is position below the main hopper discharge. When the conveyor is uncoupled from the first end of the support arm, the conveyor can rotate to a loading position wherein the discharge thereof can be positioned over the main hopper.

Language of Publication: EN

INPADOC Legal Status Table:

Gazette Date	Code	INPADOC Legal Status Impact
2021-02-18	MAFP	+
Description: MAINTENANCE FEE PAYMENT FEE PAYMENT YEAR 4 PAYMENT OF MAINTENANCE FEE, 4TH YEAR, LARGE ENTITY (ORIGINAL EVENT CODE: M1551); ENTITY STATUS OF PATENT OWNER: LARGE ENTITY		
2017-08-09	STCF	-
Description: INFORMATION ON STATUS: PATENT GRANT PATENTED CASE		
2015-04-06	AS	-
Description: ASSIGNMENT UNVERFERTH MANUFACTURING COMPANY, INC., OHIO ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:PETERSEN, BRIAN JAMES; SMITH, DAVID RICHARD; REEL/FRAME:035341/0879 2015-02-23		

Post-Issuance (US):

Reassignment (US) Table:

Assignee	Assignor	Date Signed	Reel/Frame	Date
UNVERFERTH MANUFACTURING COMPANY INC.,KALIDA,OH,US	PETERSEN, BRIAN JAMES	2015-02-23	035341/0879	2015-04-06
	SMITH, DAVID RICHARD	2015-02-23	-	-
Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).				
Corresponent: ROTHWELL, FIGG, ERNST & MANBECK, P.C. 607 14TH STREET, N.W. SUITE 800 WASHINGTON, DC 20005				

Maintenance Status (US):

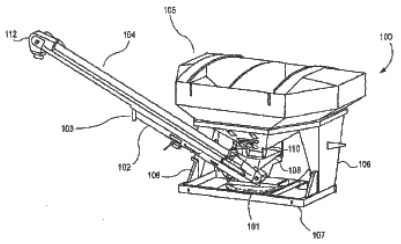
Litigation (US): 2019-01-23 2019 Unverferth Manufacturing Company, Inc. Meridian Manufacturing, Inc. N.D. Iowa 5:19cv04005 | 2018-03-12 2018 Unverferth Mfg. Co., Inc. Norwood Sales, Inc. North Dakota 3:18cv00053

Opposition (EP):

License (EP):

EPO Procedural Status:

Front Page Drawing:



Priority Number - DWPI: US2007901321P | US200831867A | US2012541553A | US14606794A
Priority Date - DWPI: 2007-02-15 | 2008-02-15 | 2012-07-03 | 2015-01-27
Assignee - Current US: UNVERFERTH MANUFACTURING COMPANY INC.

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SEED CARRIER WITH PIVOTING CONVEYOR

PATENT #	APPLICATION #	FILING DATE	ISSUE DATE
9745123	14606794	01/27/2015	08/29/2017

Payment Window Status

WINDOW	STATUS	FEES
7.5 Year	Not Open	Not Due

No maintenance fees are due at this time. 7.5 year window opens on 08/29/2024.

Window	First Day to Pay	Surcharge Starts	Last Day to Pay	Status	Fees
3.5 Year	08/29/2020	03/02/2021	08/30/2021	Closed	Paid
7.5 Year	08/29/2024	03/01/2025	08/29/2025	Not Open	Not Due
11.5 Year	08/29/2028	03/01/2029	08/29/2029	Not Open	Not Due

Patent Holder Information

Customer # 6449

Entity Status UNDISCOUNTED

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