

Amity

TECHNOLOGY



ASSEMBLY MANUAL



45-Foot Air Double Disc Drill

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TABLE OF CONTENTS

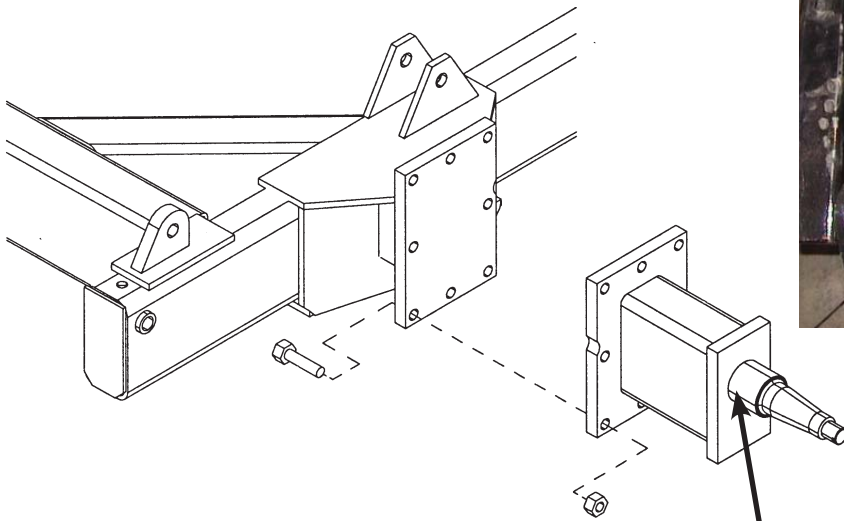
Main Frame	1
Wing Lock Towers	3
Wing Frames	4
Wing Tool Bars	5
Center Frame Tool Bar	6
Caster Frame and Casters	7
Depth Cylinder	9
Wing Lift Cylinders	10
Row Unit Mounting	11
Secondary Manifolds	15
Rear Hitch	18
Hydraulic Hoses - Tank	19
Markers	20
Primary Manifolds	24
5 to 4 Splitter	26
Monitor Modules	28
Blockage Sensors	29
Light Kit	31
Remote Work Switch	32
Decals	33

STEP 1

Attach axle weldment to each side of main frame.

Use $\frac{3}{4}$ " x 3 $\frac{1}{2}$ " bolts and Nylock nuts. Use one 3" bolt on the left axle at the top and front. A 3 $\frac{1}{2}$ " bolt in this location will interfere with the work switch bracket to be installed later. (See below)

Note that the axle is offset to the top. This is critical for the drill to function properly.



AXLE OFFSET TO TOP SIDE

Install 21.6 tires onto axles. Mount with valve stem to the outside.

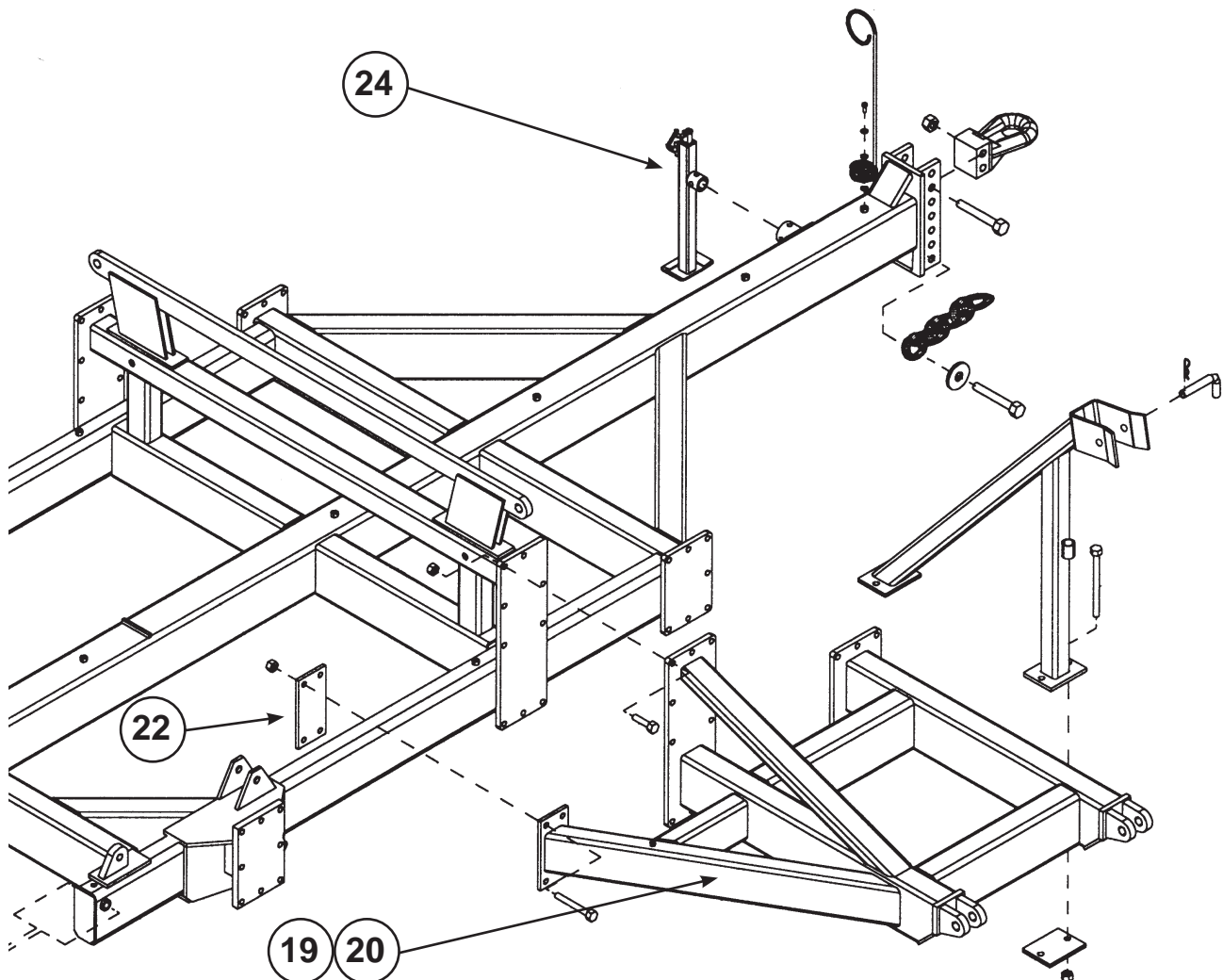
STEP 2

Mount jack assembly on front of drill.

(Item 24 in diagram below)

STEP 3

Mount frame extensions (Items 19 and 20). Attach with $\frac{3}{4}$ x 3" bolts and lock nuts. Attach the rear brace with a plate (Item 22) and $\frac{3}{4}$ x 6" bolts and lock nuts.



STEP 4

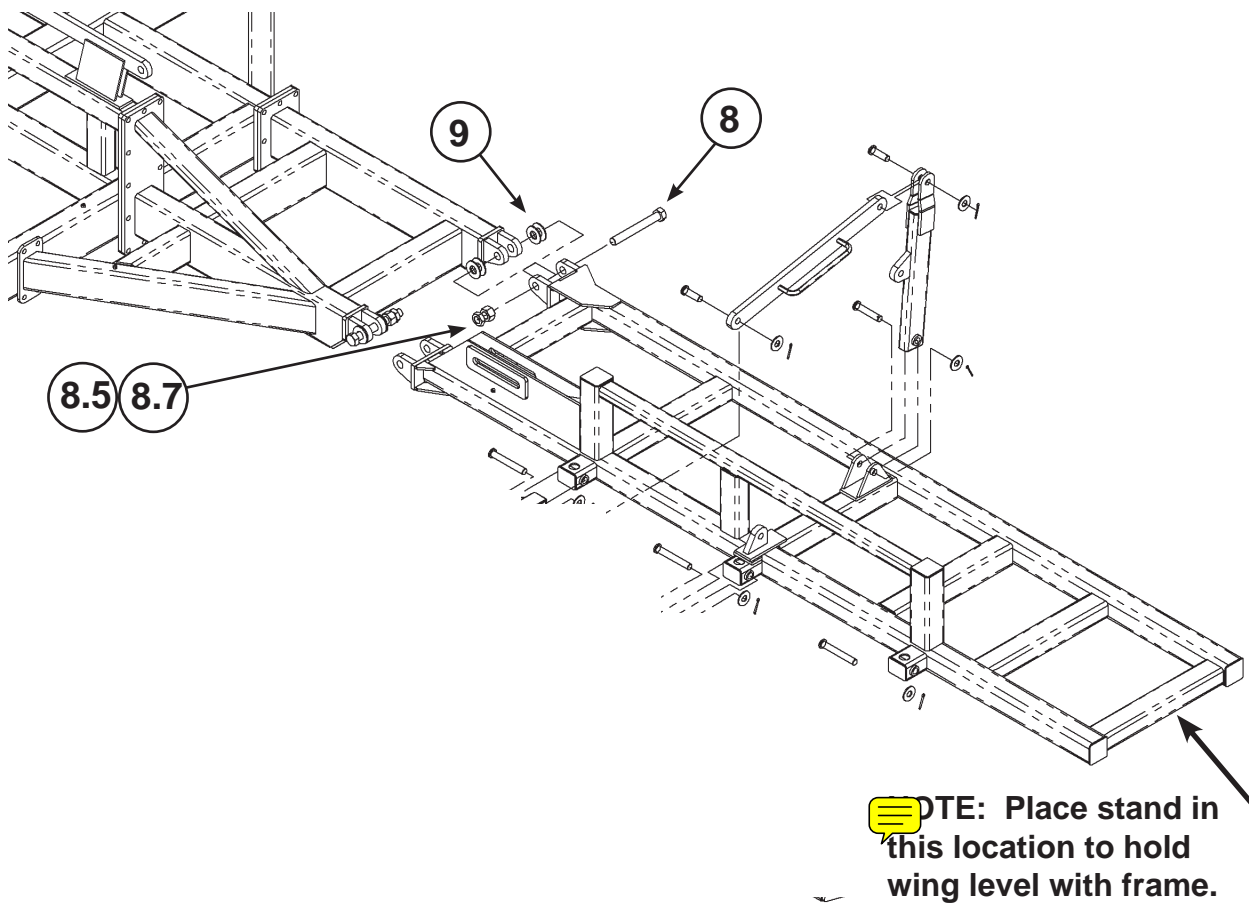
Attach wing lock towers.

Use $\frac{3}{4}$ " x 10" bolts and lock nuts. Leave bolts loose until drill is fully assembled and winged up, then slide towers against wing frame and tighten bolts.



STEP 5

Attach wing frames



Attach wing frames to main frame with 1 ¼" x 10" bolts (Item 8). Each bolt is secured with a regular nut and a narrower jam nut (Items 8.5 and 8.7). Bolts should only be tightened until there is no side to side play. Do not tighten against ears. Tighten jam nut securely against regular nut.

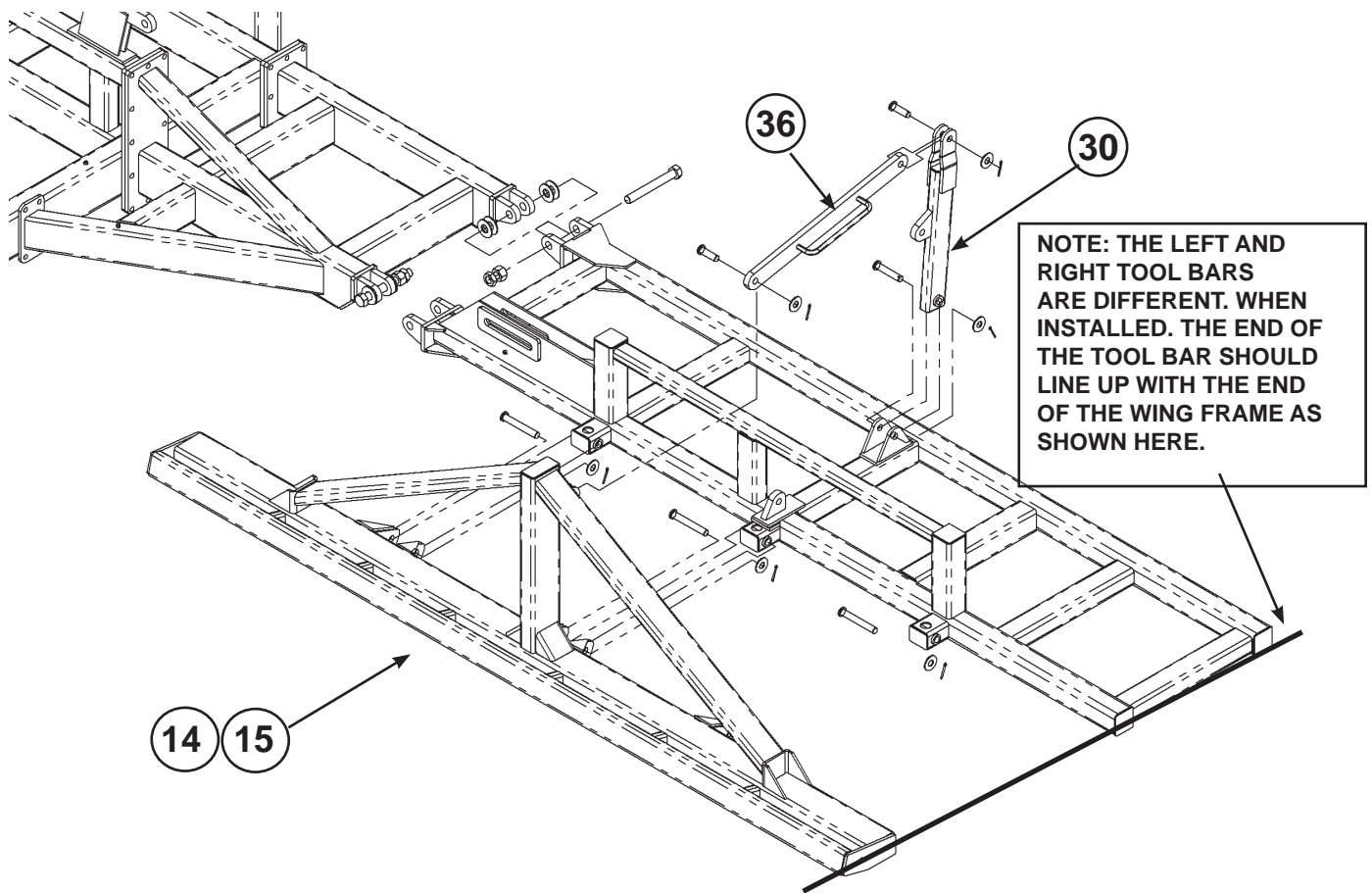
There are two 1 ¼" flat washers (Item 9) on the front and rear of the main frame ears. Use only four washers (Item 9) on each bolt as shown. Support outside of wing frame so it is level with the main frame.

STEP 6

Attach tool bars (Items 14 and 15 to the wing frames). Use 1" x 7" pins, flat washers and cotter pins.

NOTE: The left and right tool bars are different. The end of the tool bar that goes to the center of the drill is longer than the end of the tool bar that goes to the outside. The end of wing frame will be flush with the outside of drill.

Install depth control linkage (Item 30) and the adjustable top link (Item 36) with pin, flat washers and cotter pins.



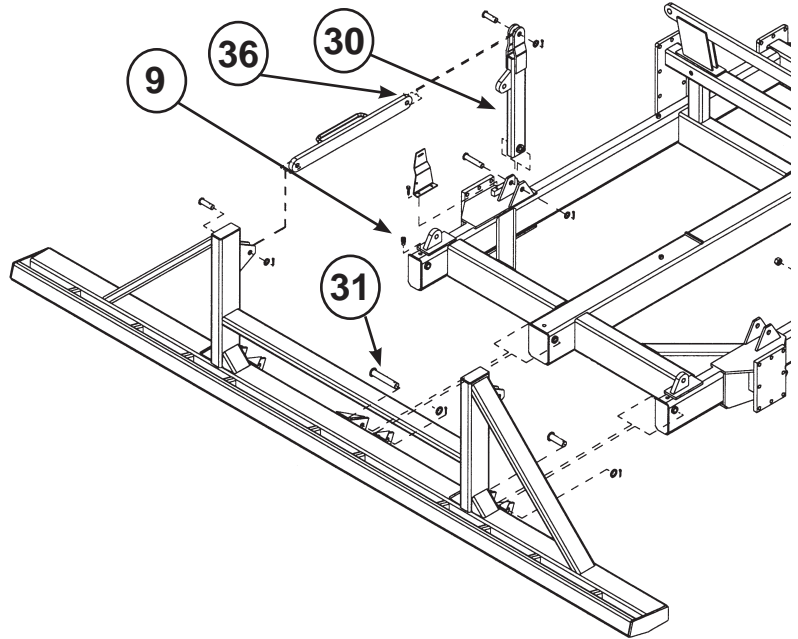
End of tool bar is in line with the end of wing frame when installed on correct side.

STEP 7

Attach center frame tool bar.

Use the longer (1" x 9") pin (Item 31) in the center location. Install extended grease zerks (Item 9) in all tool bar pivot points.


Install depth control linkage (Item 30) and the adjustable top link (Item 36) with pins, flat washers and cotter pins as shown.

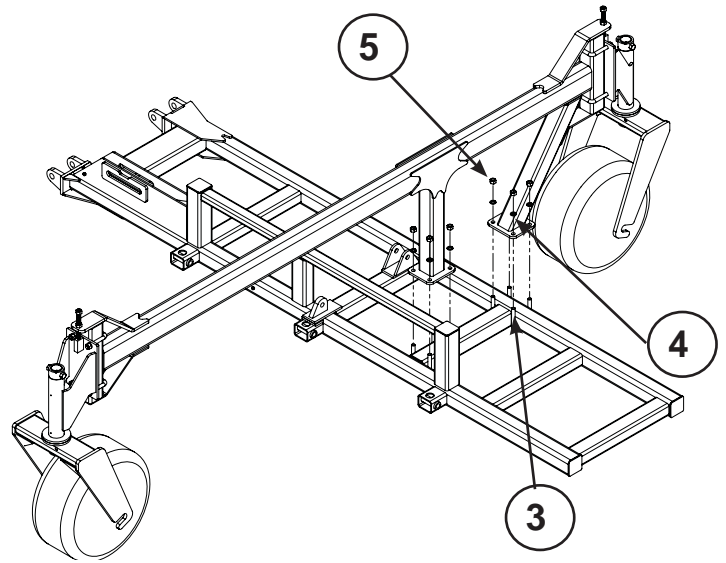


The adjustable links are used on the main frame only. Note the wing frame top link is a solid bar (see previous page). The links should be 32" center of pin to center of pin.



STEP 8

Attach caster frames to wing frames using $\frac{3}{4}$ " u-bolts (Item 3) lock washers (Item 4) and nuts (Item 5). 



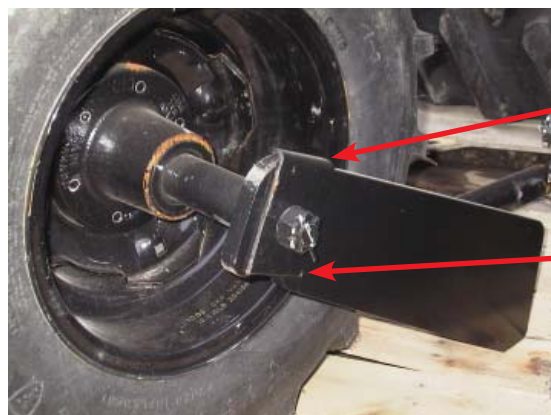
Note that the front (**slanted**) leg of the frame assembly is mounted over the front rank of the wing frame. The rear (**straight**) leg is mounted over the 4 x 4 front to rear frame brace member. This is the third front to rear brace from the end.

Assemble casters to look like the picture below. Note that the angle tab on the end of the axle shaft is opposite the slot in the caster.



Tire should be in center of caster. If not, it is mounted backwards on the hub.

NOTE: ONLY TIGHTEN AXLE NUT UNTIL A SMALL RESISTANCE IS FELT WHEN TURNING WHEEL. BEARING FAILURE WILL RESULT IF OVER TIGHTENED.



Tab hooks opposite slot

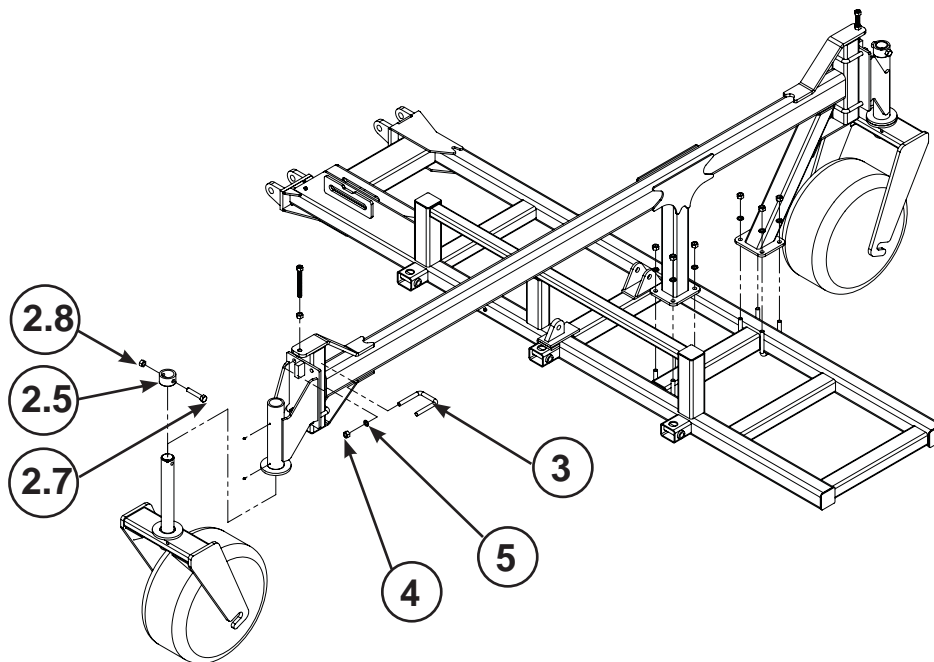
Slot in caster

STEP 8 (continued)

Slide casters pivot onto caster shaft and secure with the retaining ring (Item 2.5), bolt (Item 2.7) and nut (Item 2.8).

Install adjustment bolt into top of caster mount frame. Install one nut on top and one nut on bottom of bracket.

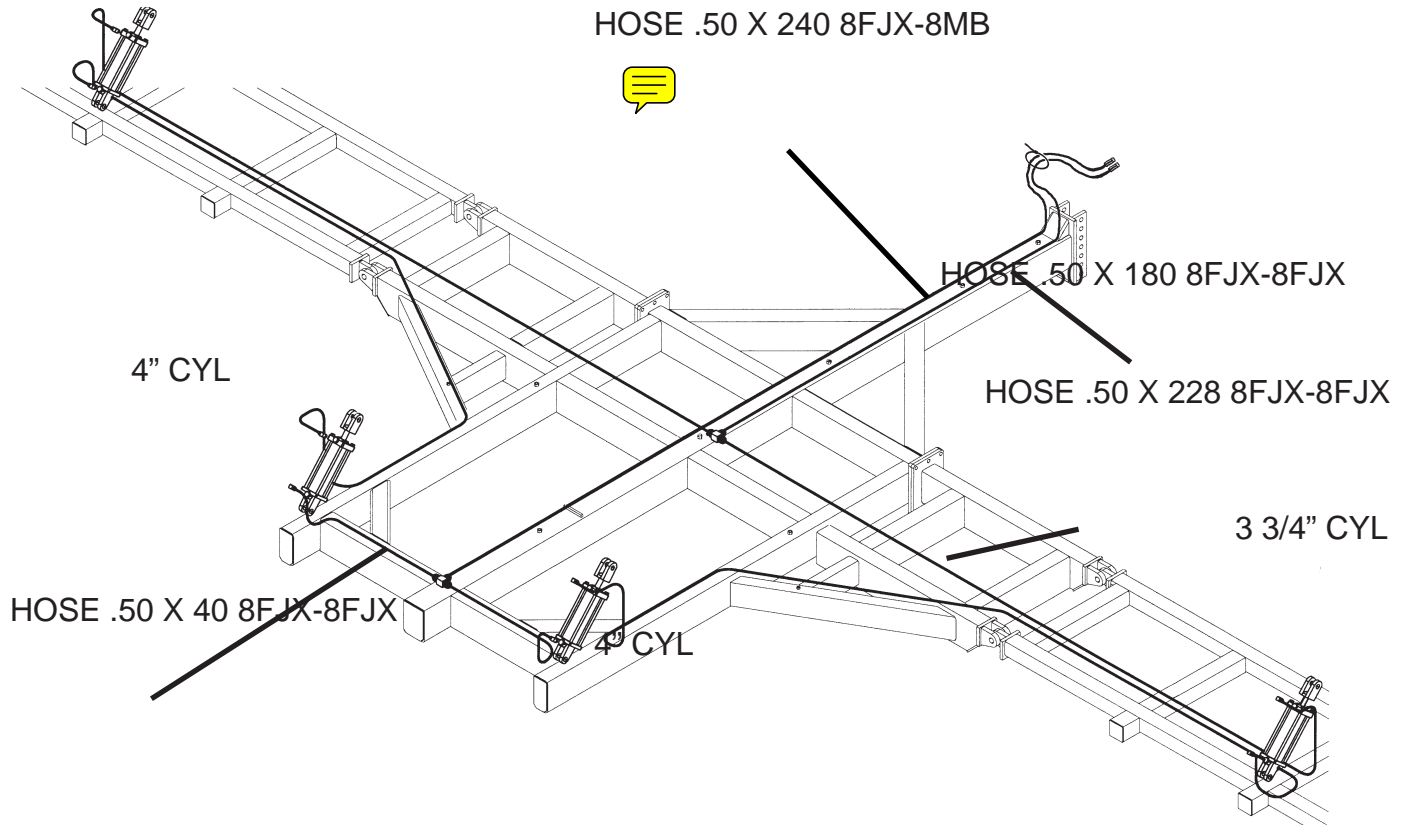
The bottom of the bolt should be $1\frac{1}{2}$ " from bottom of mounting plate. Mount assembled caster using $\frac{3}{4}$ " u-bolt (Item 3) lock washers (Item 5) and nuts (Item 4).



STEP 9

Install depth cylinders and hoses

Install depth cylinders into depth control linkage. Note that the larger 4" cylinders mount on the main frame and the 3 3/4" cylinders mount on the wings.



The cylinder decals indicate the size of the cylinder. The cylinder with a 40P in the number is the 4" and the one with 37P in the part number is the 3 3/4".

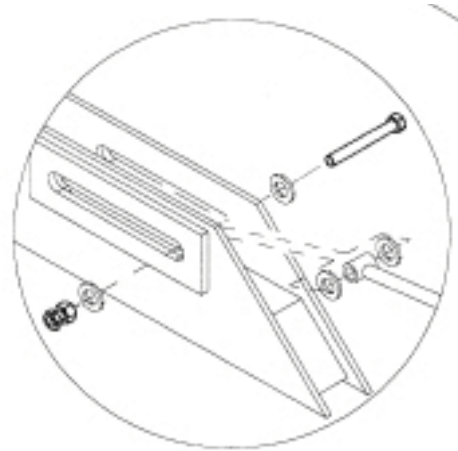
Mount the cylinders with the rod up and the fitting ports on top. Install 90 degree O-ring fittings with the outlets to the rear of the drill. Run hoses as shown.

Install a complete bag of depth stops in each cylinder to hold the tool bars in the raised position.



STEP 10

Install wing lift cylinders and hoses. Pin the base end of the cylinders to the main frame with cylinder pins provided. Remove plugs from cylinders. Pull cylinder rods out as far as possible.



Connect rod end of cylinder into slotted hole on wing frame according to detail above. Flat washers are used on each side of each slot as shown. **Tighten nut only until it is close to slotted hole. Do not clamp bolt onto wing frame.** It has to be loose to slide freely. Use the jam nut to secure the nut.

Point fittings toward center of drill.  **Note that there is a restrictor on the rod end of each cylinder.** Install wing lift hoses.

NOTE: A 2 ½ FOOT LONG EXTENSION BOLTS BETWEEN THE CYLINDER AND THE MOUNT ON THE 45' MAIN FRAME. ATTACH WITH U-BOLTS.



STEP 11

Mount row units. Measure out and mark opener locations per table below. Dimensions shown are from center of drill to center of row unit.

Opener spacing from center of drill to center of opener

45 foot wide center frame

6 3/4 inch spacing

171.45 mm spacing

3 3/8	85.73	Center of drill to center of opener
10 1/8	257.18	
16 7/8	428.63	
23 5/8	600.08	
30 3/8	771.53	
37 1/8	942.98	
43 7/8	1114.43	
50 5/8	1285.88	
57 3/8	1457.33	
64 1/8	1628.78	
70 7/8	1800.23	
77 5/8	1971.68	
84 3/8	2143.13	
91 1/8	2314.58	
97 7/8	2486.03	
104 5/8	2657.48	
111 3/8	2828.93	Last unit on main frame
118 1/8	3000.38	First unit on wing
124 7/8	3171.83	
131 5/8	3343.28	
138 3/8	3514.73	
145 1/8	3686.18	
151 7/8	3857.63	
158 5/8	4029.08	
165 3/8	4200.53	
172 1/8	4371.98	
178 7/8	4543.43	
185 5/8	4714.88	
192 3/8	4886.33	
199 1/8	5057.78	
205 7/8	5229.23	
212 5/8	5400.68	
219 3/8	5572.13	
226 1/8	5743.58	
232 7/8	5915.03	
239 5/8	6086.48	
246 3/8	6257.93	
253 1/8	6429.38	
259 7/8	6600.83	
266 5/8	6772.28	


Opener spacing from center of drill to center of opener

40 foot wide center frame

6 inch spacing

152.4 mm spacing

Center of drill to center of opener

3	76.2	
9	228.6	
15	381	
21	533.4	
27	685.8	
33	838.2	
39	990.6	
45	1143	
51	1295.4	
57	1447.8	
63	1600.2	
69	1752.6	
75	1905	
81	2057.4	
87	2209.8	
93	2362.2	Last unit on main frame
99	2514.6	First unit on wing
105	2667	
111	2819.4	
117	2971.8	
123	3124.2	
129	3276.6	
135	3429	
141	3581.4	
147	3733.8	
153	3886.2	
159	4038.6	
165	4191	
171	4343.4	
177	4495.8	
183	4648.2	
189	4800.6	
195	4953	
201	5105.4	
207	5257.8	
213	5410.2	
219	5562.6	
225	5715	
237	6019.8	
237	6019.8	

Opener spacing from center of drill to center of opener

45 foot wide center frame

6 inch spacing

152.4 mm spacing

Center of drill to center of opener

3	76.2	
9	228.6	
15	381	
21	533.4	
27	685.8	
33	838.2	
39	990.6	
45	1143	
51	1295.4	
57	1447.8	
63	1600.2	
69	1752.6	
75	1905	
81	2057.4	
87	2209.8	
93	2362.2	
99	2514.6	
105	2667	
111	2819.4	<u>Last unit on main frame</u>
117	2971.8	First unit on wing
123	3124.2	
129	3276.6	
135	3429	
141	3581.4	
147	3733.8	
153	3886.2	
159	4038.6	
165	4191	
171	4343.4	
177	4495.8	
183	4648.2	
189	4800.6	
195	4953	
201	5105.4	
207	5257.8	
213	5410.2	
219	5562.6	
225	5715	
237	6019.8	
237	6019.8	
243	6172.2	
249	6324.6	
255	6477	
261	6629.4	
267	6781.8	



STEP 11 (continued)

Start at right end of drill. Mount a long row unit using a 5/8" u-bolt and locknuts.

1.) Insert a 1/2" x 4 1/2" bolt through the opener and down pressure spring assembly. Insert bolt from opposite side that is shown on the picture. Insert in most forward hole of the 4 holes on opener.

Remove quick clip and one washer from top of spring rod. Raise row unit so that spring rod goes through plastic bushing at top of mount assembly. Replace washer and quick pin.

2.) Insert a second 4 1/2" bolt through rear hole in opener assembly. Place a packer wheel assembly on the two bolts and secure with top lock nuts. Do not over-tighten. Row unit can be bent if bolts are too tight. Continue adding units to the left. When you get to the left wing, start with a short row unit on the inside of the wing.



STEP 12

Install manifolds on tool bars and install 1" hoses.



Mount each manifold stand per the diagram on page 15.



Use a 1/2" u-bolt to attach stand to the tool bar.

Attach a manifold tube to each manifold mount.

Attach with muffer clamps. Note that the welded joint between the elbow and tube is nearly level with the bend in the manifold stand.

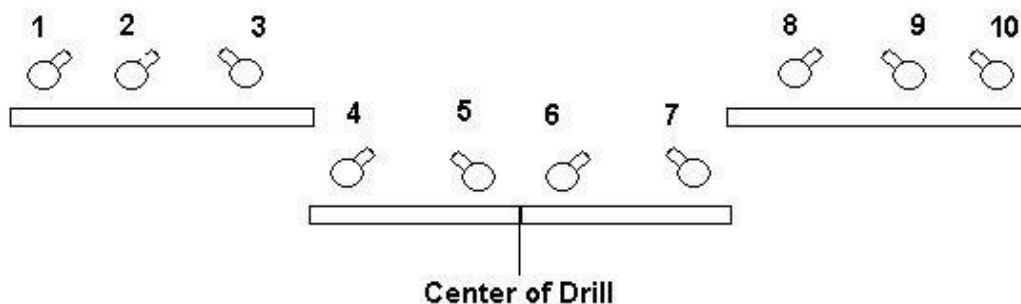
NOTE: On the inside manifold on each wing, an offset bracket is included to set the manifold back. It is to make clearance so it doesn't hit the wing lift cylinder when the drill is folded.

The diagram on page 17 shows the direction to point the outlets on the manifolds.



Connect 1 ¼" hoses between manifold outlets and disk openers. Fasten hoses with hose clamps. Cut all of the 1 ¼" hose to 75" long (191 mm).





Manifold 1 - Mount between row units 5 and 6 from left end of drill. Point outlet as shown

Manifold 2 - Mount between row units 11 and 12 from left end of drill. Point outlet as shown

Manifold 3 - Mount between rows units 18 and 19 from left end of drill. Point outlet as shown

Manifold 4 - Mount between units 5 and 6 from left end of tool bar. Point outlet as shown

Manifold 5 - 8 Mount mirror image to left side of drill

Manifolds 1 and 10 have 7 outlets

Manifolds 2, 3, 4, 7, 8 and 9 have 8 outlets

Manifolds 5 and 6 have 9 outlets

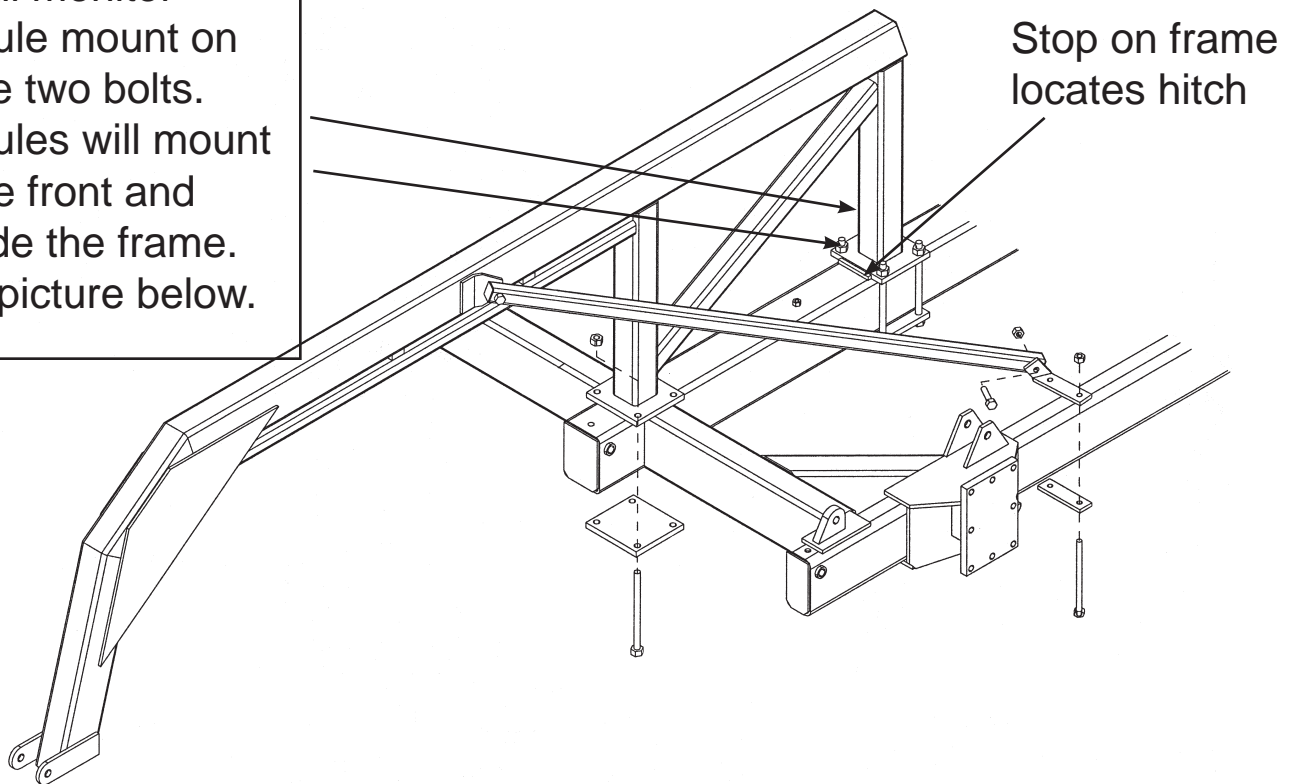
STEP 13

Install rear hitch.

Attach rear with bolting plates and $\frac{3}{4}$ " x 11" bolts. Note that the hitch is located by a stop and welded on the top of the main frame.

Attach side braces with hardware shown.

Install monitor module mount on these two bolts. Modules will mount to the front and beside the frame. See picture below.



Install monitor module mount bracket to two of the hitch mount bolts as shown at right

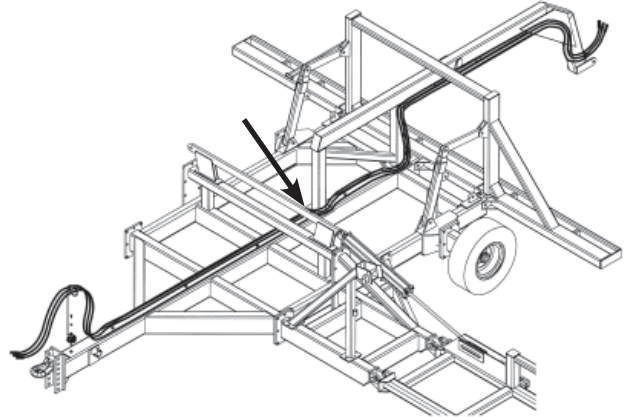


STEP 14

Install hydraulic hoses for tank.

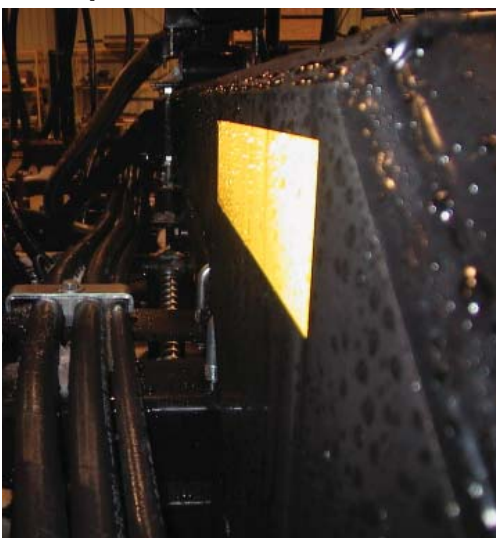
Four of the $\frac{3}{4}$ " lines are in this kit. The two hoses with the $\frac{3}{4}$ " pipe fittings go to the rear of the drill with the $\frac{3}{4}$ " pipe fitting ends to the back and the flare fittings to the front. The other two attach at the flare fitting and have $\frac{1}{2}$ " pipe thread fittings at the tractor end.

Attach the hoses together at the flare fitting but do not tighten. A valve will be installed at this location when the markers are installed.



Run the $\frac{1}{2}$ " line front to rear. It has the same fitting on both ends. Attach the large breakaway couplers at the back of the drill on the $\frac{3}{4}$ " lines. Attach the $\frac{1}{2}$ " coupler of the same style on the $\frac{1}{2}$ " line at the back of the drill.

Two flat brackets attach to the bottom of the rear hitch to support hoses. Attach to hitch with u-bolt and attach hoses to bracket with clamp and $\frac{3}{8}$ " bolts. Attach hoses to rear hitch with hydraulic hold down clamp and $\frac{3}{8}$ " bolt.



STEP 15

Install markers

Install slanted mounts leaning forward on front and rear rank. Mounts should be 11-inches from end of drill frame. Attach with 5/8" u-bolts.



Mount straight stand just inside front to rear frame member. Attach with 5/8" u-bolts but do not tighten.

Place marker main mounts onto stands and fasten down to slanted stands with 5/8" u-bolts and to straight stand with 5/8" x 4" bolts. Line up straight stand so that all hardware is straight and tighten all hardware.




Install markers beams onto main mount with 1 1/4" pins and secure with 3/8" bolt and locknut.

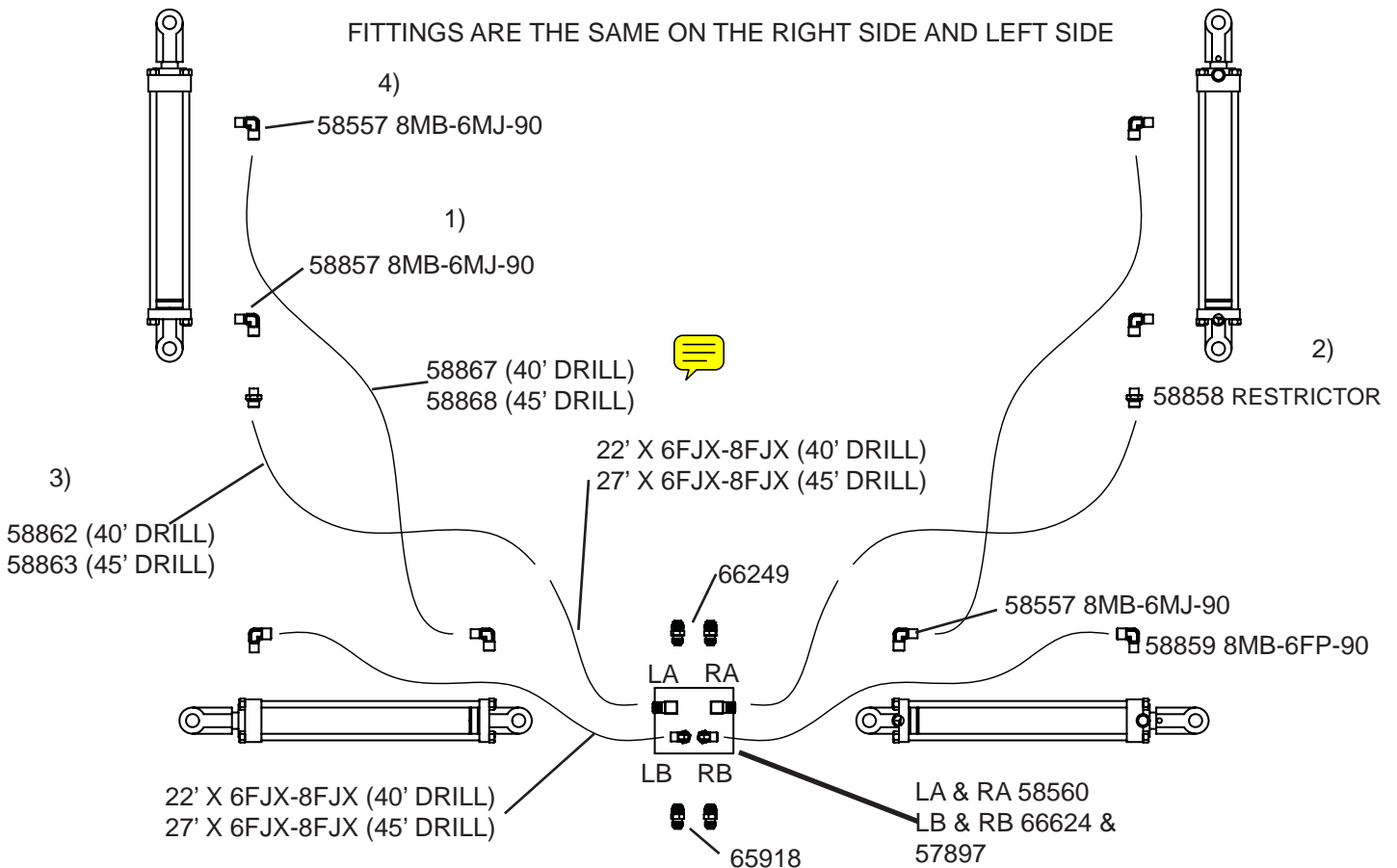
Install 2 ½" cylinder between main mount and marker beam. This is referred to as the swing cylinder.



Hoses to cylinder mounted on marker beam (**tip over cylinder**)

Tow short hoses come with the marker that connect to the cylinder on the marker beam.

- 1) Install an O-ring fitting into the base end of cylinder that has a 3/8" male pipe fitting on it. 
- 2) Install a restrictor onto this fitting.
- 3) Connect one of the short hoses to the restrictor that has a 3/8" male pipe end on it. The other end of this hose will connect to a drill hose that goes to the center of the drill.
- 4) Install an o-ring fitting with a flare on it into the rod end of the cylinder. One of the short hoses will connect to this fitting and to a o-ring fitting on the base end of the swing out cylinder.



At the center of the drill

Mount the marker valve assembly (**large black valve with two solenoids on it**) to the top of the 4 x 4 tube that runs between the wing lift cylinders. Mount with the small ports to the top and the solenoids to the left side of the drill. Attach with back strap and ¼ bolts.



Connect the ¾ hydraulic hoses to the front and rear of the valve. The hose that connects to the “P” port needs to be the hose that connects to the diverter on the air seeder tank.


Install the 90 degree o-ring fittings to the two outer ports of the group of four ports on top of the valve (**LA and RA**). Install the straight o-ring to flare fittings into the center two ports (**LB and RB**). Install the 90 degree swivel adapters to the straight fittings.

Connect the hoses from the markers to the fittings on top of the valve. Connect the left marker hoses to the left fittings on the valve and the right marker hoses to the right fittings on the valve. The hoses have different size ends so they cannot be connected incorrectly.

STEP 16

Install primary manifolds

Install primary manifold mount. This is the square tubing with the large bolting plate on the bottom. Attach to frame with 8-inch wide u-bolts. Position the manifold in the frame location shown.

Attach primary manifolds to mounts with 4-inch muffler clamps. Bolt the clamps to the stands with the bolt in the middle of the clamp. Secure the manifold to the clamps at a height where the inlets are at a level just above the main frame members of the drill. 

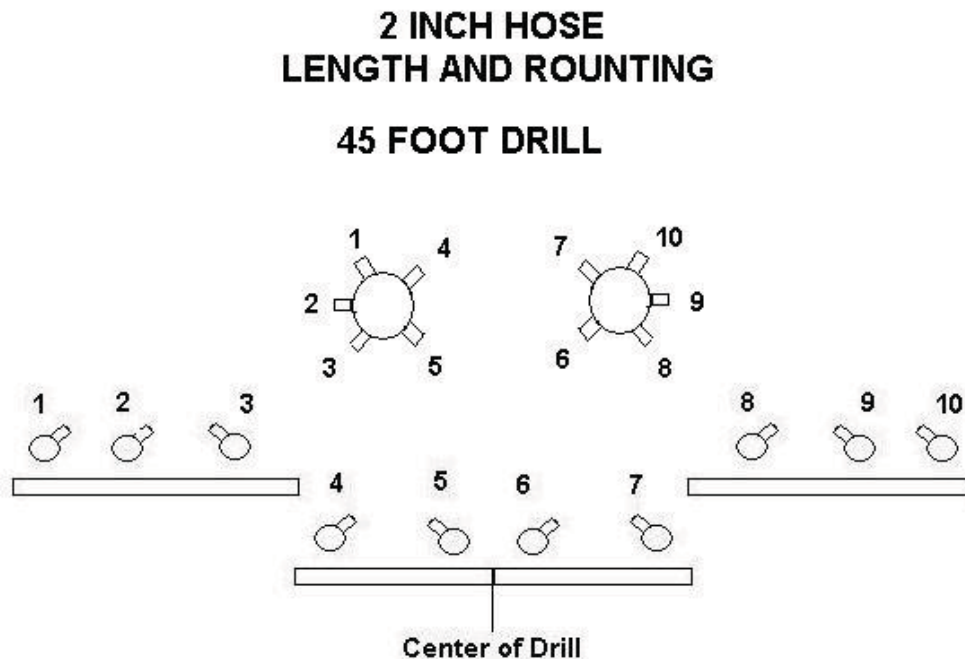
Offset manifolds about 2-inches in height to make it easier to install the 4-inch flexible hoses.

Install primary manifolds on top of mounts on top of manifold tubes and secure with muffler clamp.



Position the outlets as shown on diagram. Hoses are precut to connect to secondary manifolds. Use the two longest hoses on the outside manifolds and the rest of the hoses on the other manifolds.

Connect ports on primary manifold to small manifolds as indicated in the diagram.



**2 inch hose lengths.
Cut hoses to following lengths**

Hoses 1 and 10 21 feet

Hoses 2 and 9 17 feet, 6 inches

Hoses 3, 4, 7, 8 18 feet, 4 inches

Hoses 5 and 6 14 feet, 4 inches

STEP 17

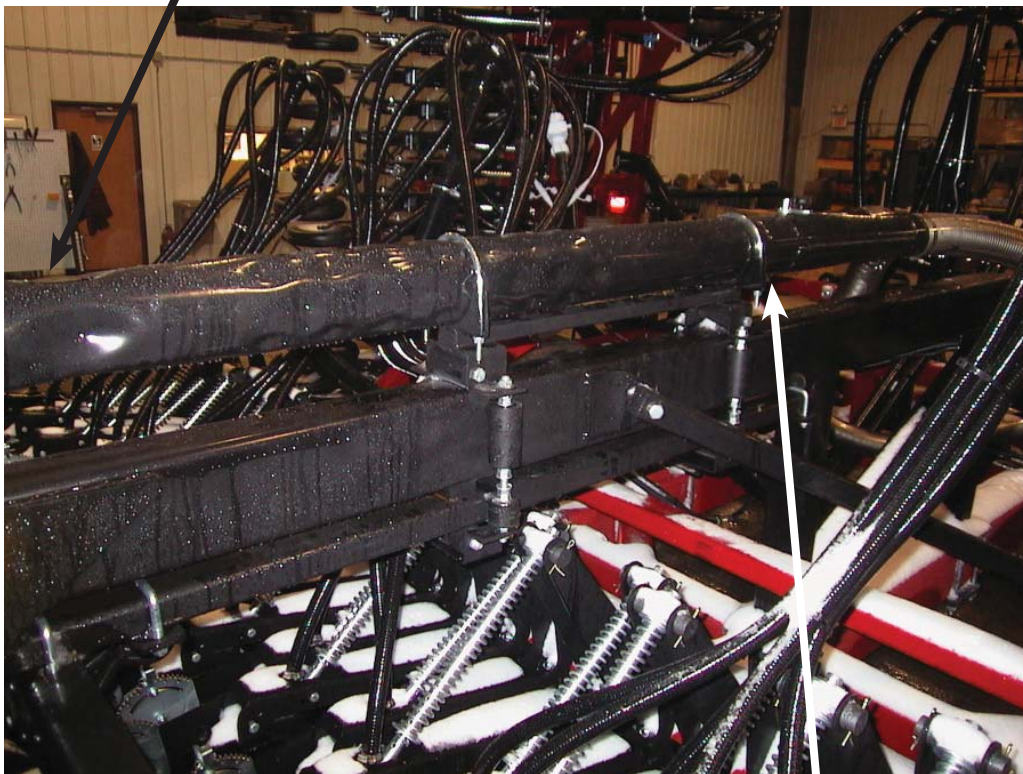
Install the rolling mount for the 5-inch splitter onto the rear hitch.

Adjust rollers on threaded rods so the mount slides back and forth easily.

Clamp splitter into mount with the two 4-inch outlets to the front of the drill.

Position the splitter so that the front clamp will be close to the front side of the splitter.

Large dimples to rear



Front clamp close to front of straight section

STEP 18

Install flex 4-inch tubing from splitter to manifold.

Connect line from outlet ports on splitter. They cross at the front of the drill and connect to the primary manifolds.



Keep primary towers as close to same height as possible. They will be a little different to allow 4-inch lines to cross.



STEP 19

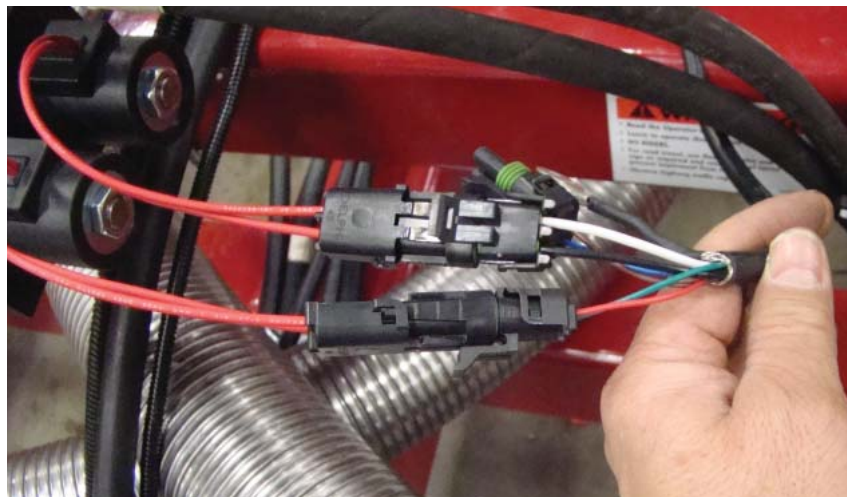
Mount two monitor modules to the main frame of the drill. The modules are labeled “Art module” and “three load module”. Mount on module plate mounted to rear hitch mounting bolts. The modules plug into each other.



Connect the longest large black monitor cable (5 meter) to the front of the modules and route to the front of the drill. Connect a 3 meter to the rear of the modules and route to hitch point at rear of drill.

From the marker valve with hoses going to the left marker, plug the two wire plug into the wire pair from the 3 load module that has white and black wires.

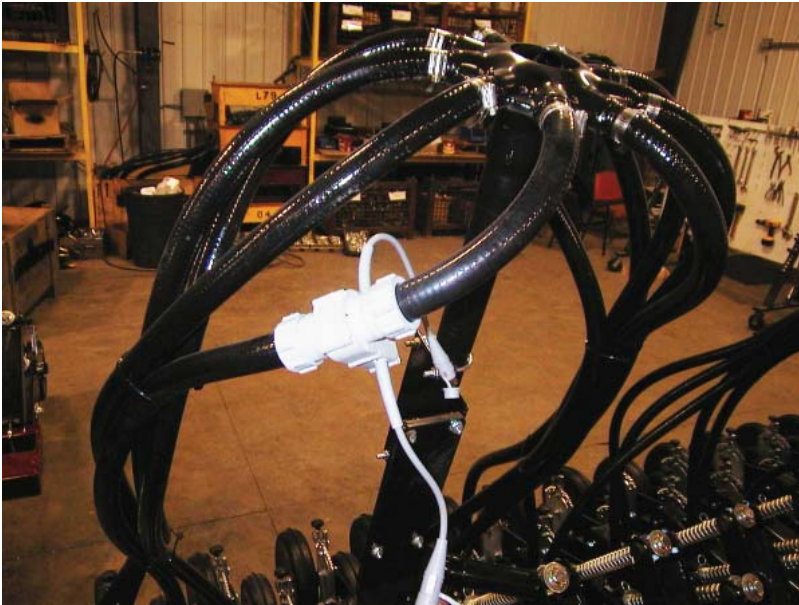
From the marker valve with hoses going to the right marker, plug the two wire plug into the wire pair from the 3 load module that has red and green wires.



STEP 20

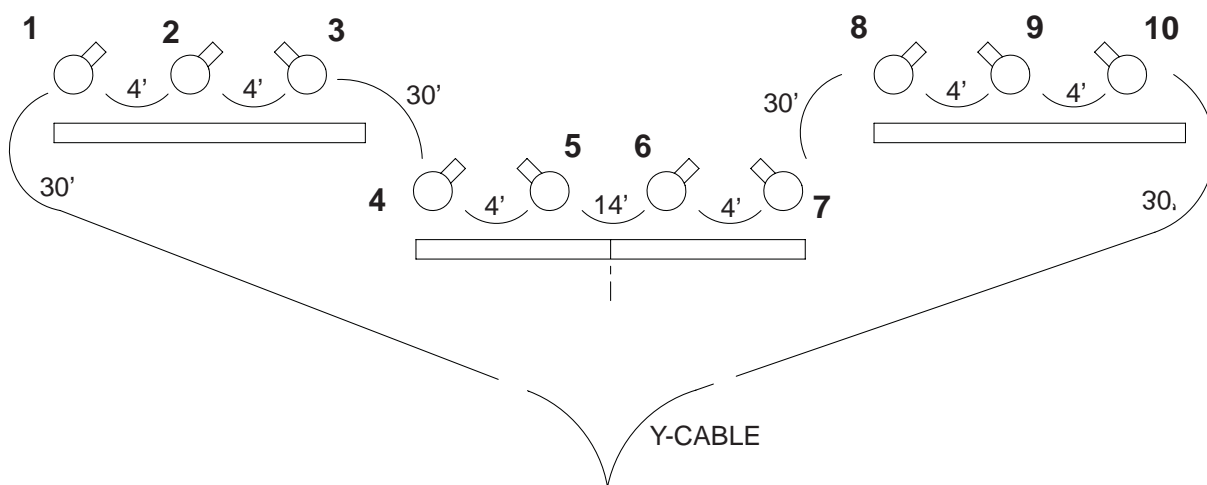
Install Zone blockage sensors

Cut one manifold hose on each of the manifold towers about 10 inches from the top. Slide cut ends of hoses onto sensor and secure with clamp. Install sensors so that the wires come out the bottom side.



Two wires come from the flow module on the module bracket. The wires have arrows on the plug end. The arrow going out will go to the first sensor on the left end of the drill. Use extension wires as needed. See wire routing below.

Connect the sensor on the first manifold to the sensor on the next manifold. Continue connecting manifolds until all sensors are connected. Connect the last sensor in line back to the module.



Wires needed at each location

To Connect	Length	Harnesses to use
Y-Cable to 1	30	20 ft + 10 ft.
1 to 2 and 2 to 3	4	4 ft.
3 to 4	30	20 ft + 10 ft.
4 to 5, and 6 to 7	4	4 ft.
5 to 6	14	10 ft. + 4 ft.
8 to 9 and 9 to 10	4	4 ft.
10 to Y-Cable	30	20 ft. + 10 ft.

Install all run sensors

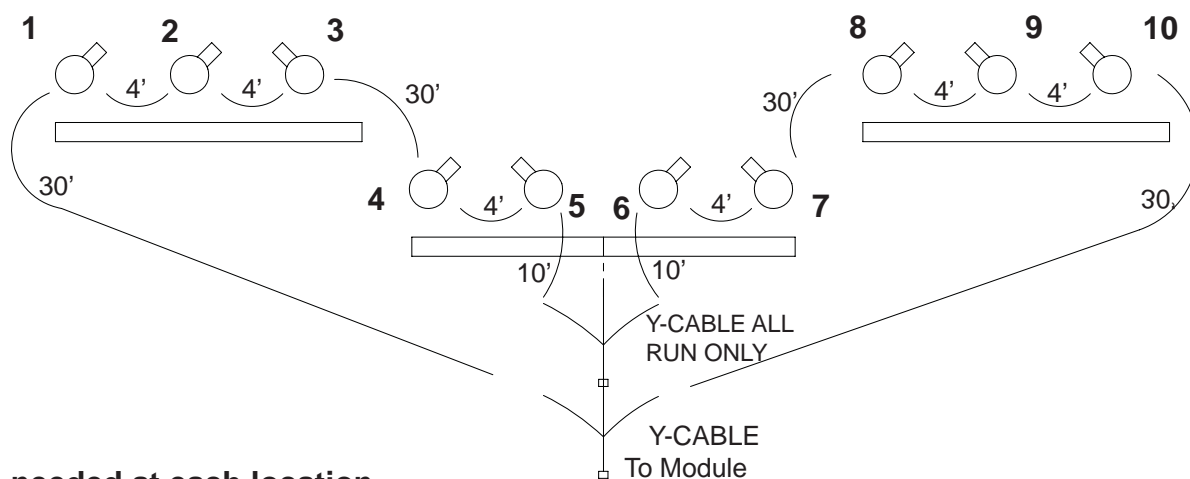
Cut one manifold hose on each of the manifold towers about 10 inches from the top. Slide cut ends of hoses onto sensor and secure with clamp. Install sensors so that the wires come out the bottom side.

Two wires come from the flow module on the module bracket. The wires have arrows on the plug end. The arrow going out will go to the first sensor on the left end of the drill. Use extension wires as needed. See wire routing below.

Connect the sensor on the first manifold to the sensor on the next manifold. Continue connecting manifolds until all sensors are connected. Connect the last sensor in line back to the module.



Connect second Y-Cable to first Y-Cable. Disconnect sensor lines at center of drill and connect to sensor lines on Y-Cable.



Wires needed at each location

To Connect	Length	Harnesses to use
Y-Cable to 1	30	20 ft + 10 ft.
1 to 2 and 2 to 3	4	4 ft.
3 to 4	30	20 ft + 10 ft.
4 to 5, and 6 to 7	4	4 ft.
5 to Y-Cable and 6 to Y-cable	10	10 ft.
8 to 9 and 9 to 10	4	4 ft.
10 to Y-Cable	30	20 ft. + 10 ft.

STEP 21

Install the light kit and harness.



Lay out harness on drill.

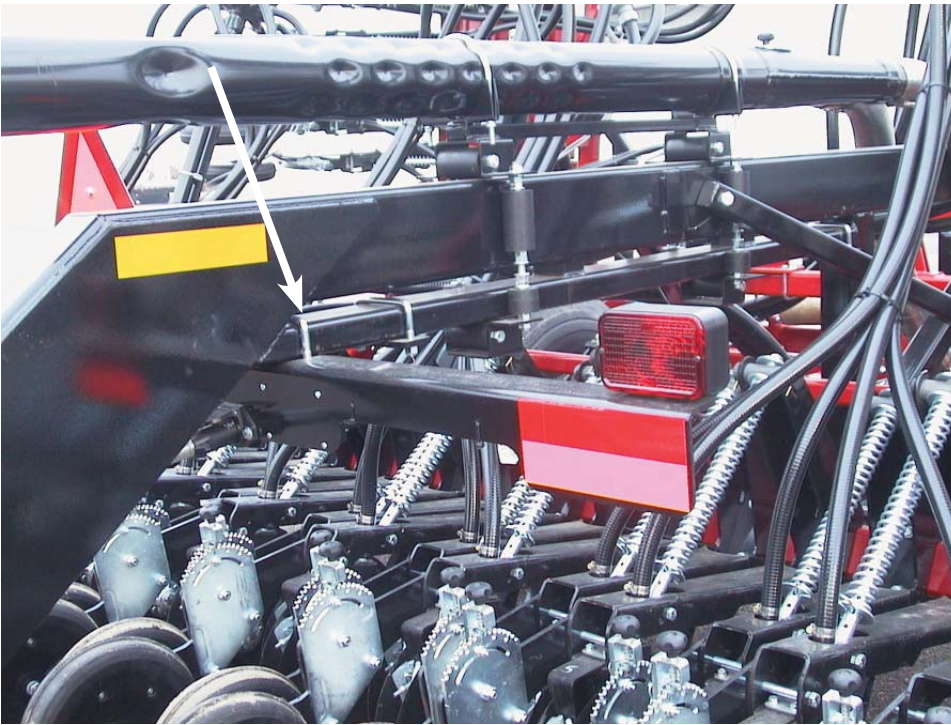
The large round end goes to drill front.

The two wire-side light wires and taillights are both labeled.

The front lights attach to brackets mounted on the wing lock towers. Offset on bracket is to front. Attach to wing lock tower with a u-bolt.



Note: Remember to tighten nuts on wing lock towers.



Bracket attaches with u-bolt to rear hitch.

Note the light and decal placement.

Light kit module (a black electrical box) and the plug in for the back of the drill attach to the slow moving vehicle mount bracket that hangs under the rear hitch. Module for light attaches to back side of bracket. 🗨️

Plug in on light harness mounts into bracket.

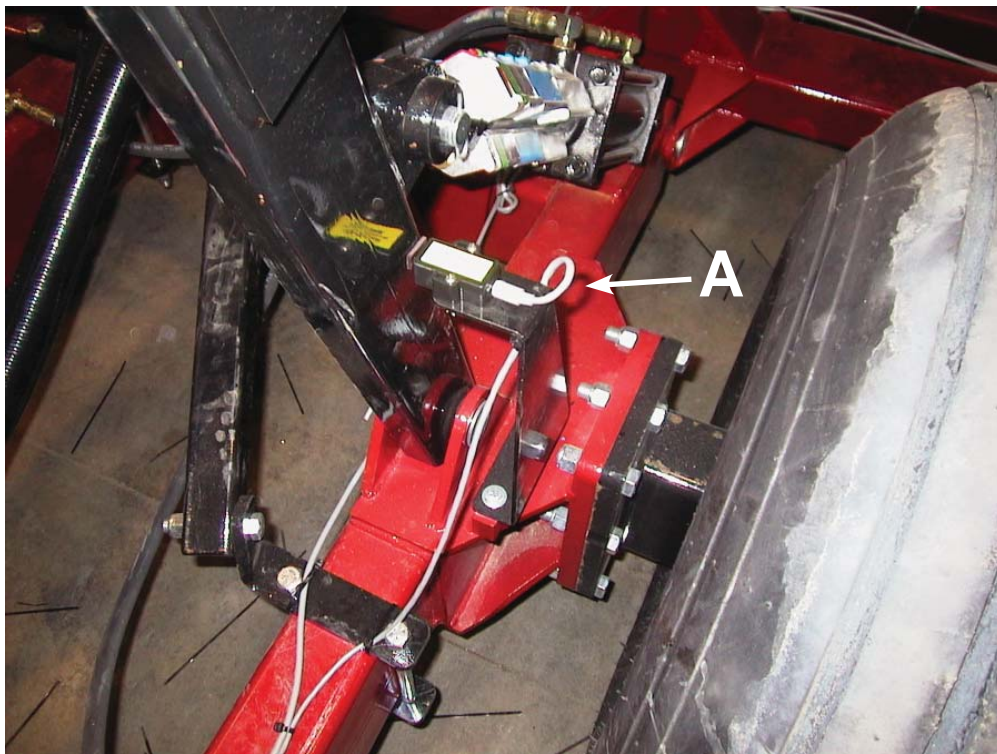
SMV sign mounts on left side of bracket.



STEP 22

Mount the remote work switch on drill - it mounts to a bracket near the left main frame tire. (item A on diagram below) Connect a 4 meter minidin cable (small black monitor wire) to the work switch and plug it into any port on the bottom of the 3-load or flow module in the center of the drill. There are two locations on each module to plug in sensors (it doesn't matter which one you use).

A magnet comes with the sensor that goes on the depth control linkage arm near the work switch. The magnet should be placed so that it lines up with the sensor when the drill is in the fully raised position.



The switch should be about 1/8" away from the magnet.

If in operation, the switch works backwards and turns the meters on in the up position and off in the down position, the operation can be reversed as part of the calibration of the monitor. (see monitor manual).

DECALS

Attach decals as follows

Logo and model to main frame and extension



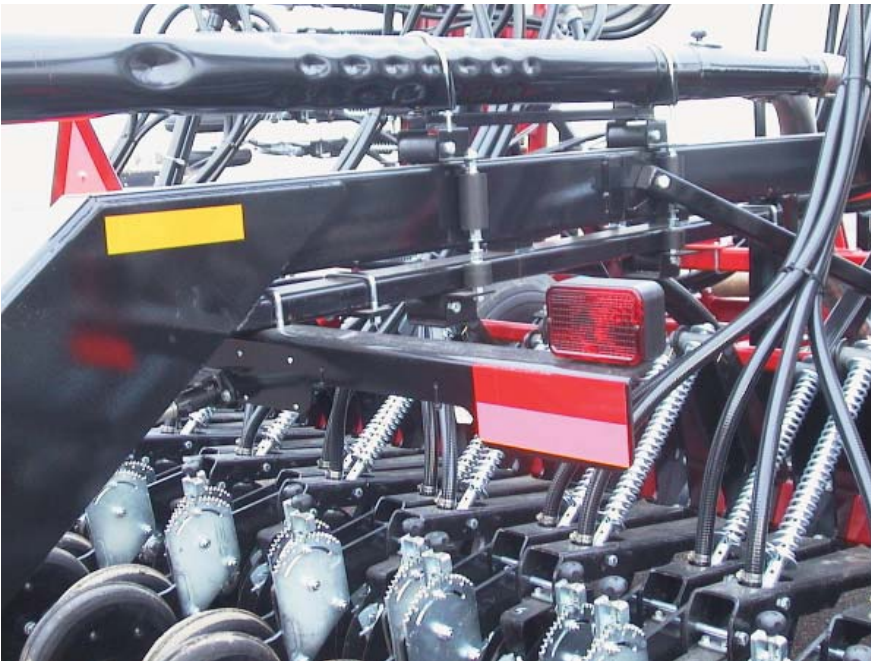
Warning decals

Reflective - Red over yellow on flat plate

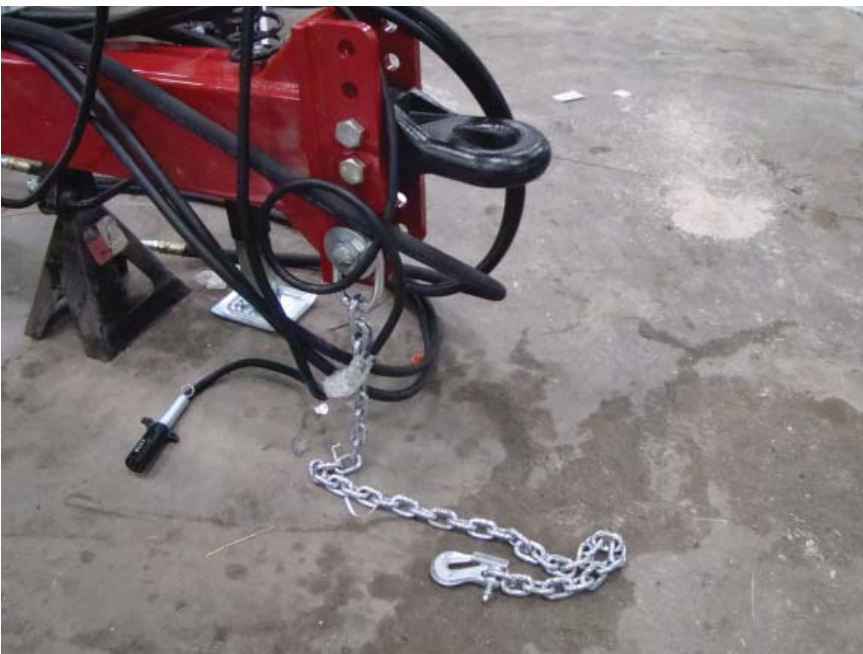
Transport pin warning - on wing lock tower.



Remaining warning labels - on center frame top bar



Reflector decals - on light bracket is red over yellow



Safety chain and front hitch

Adjust hitch to location where drill frame is level