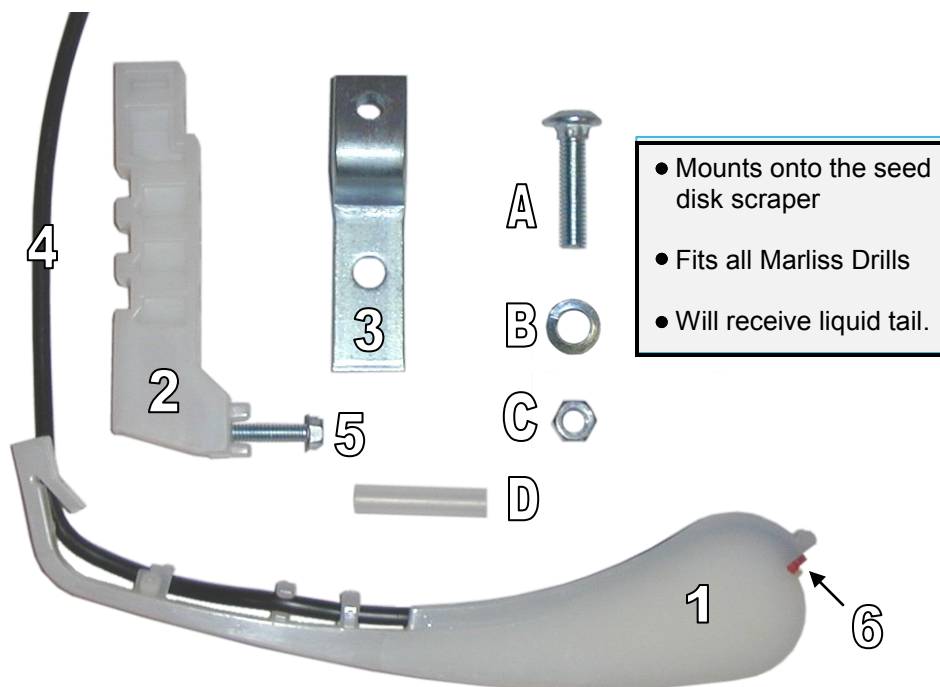


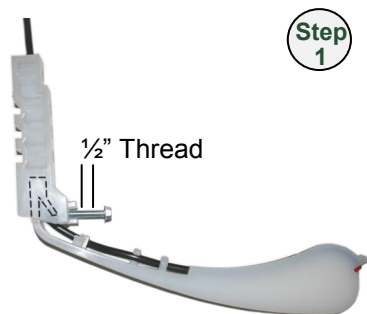
Mounting Instructions for a Marliss Drill

Parts List

1. Firmer Tail, (120820)
 2. Poly Mounting Bracket, (150049)
 3. Metal Mounting Bracket, (150049)
 4. Tubing, (129BXT814)
 5. Tension Screw, (32411)
 6. Liquid Splitter (125006)
- Hardware Kit includes (160019)
- A) 1 - $\frac{3}{8}$ x 2" Carriage bolt, (21361)
 - B) 1 - Lock washer, (33622)
 - C) 1 - $\frac{3}{8}$ " Hex nut, (36306)
 - D) 1 - $\frac{1}{4}$ x $\frac{3}{8}$ " Splice Piece, (900107)



Installation Instructions



Step 1

Assemble 2-piece liquid firmer by inserting the Tail into the poly base as shown. Make sure tension screw is below the tab on Tail section. Tighten down tension screw till $\frac{1}{2}$ " threads are showing, to hold the tail in place.



Step 2

Lower the drill so that the opening disks rest on a flat surface or on the shop floor. Remove the outside disk openers and the scraper assembly from the row unit.

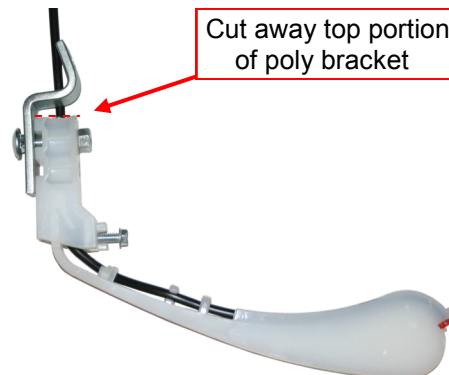
Without Modification



Step 3

On some drills the firmer will have to be modified to fit behind the seed tube. The metal bracket is then mounted on the front of the firmer instead of the back.

With Modification



Cut away top portion of poly bracket

Questions? Check the website: www.precisionplanting.com or call us at 309-925-5050.

Continued Installation Instructions



Step
4

Remove the scraper bolt. Place the firmer bracket between the scrapers and re-insert the bolt. Install the assembly on the drill

After mounting the first unit on the drill, measure the height from the Firmer's tension screw to the ground. That distance should be approximately 4" to 4 1/2". Repeat the procedures for each unit.

Step
5

Liquid Firmer Tubing Connections: Liquid Firmers include 1/4" tubes and splicer's. These splicer's are provided so you can splice the provided tubes into the supply line from your manifold. If you are NOT using liquid, simply remove the black tube by snipping the tie strap that secures the tube to the firmer. Then remove the red splitter which is attached to the tube at the end of the firmer tail.

Step
6

Reinstall disk openers: Check your operations manual for proper shimming and contact of your double disk openers. Replace the disks and tighten all bolts.

Step
7

Adjusting Firmer tension: Ideal firmer tension is 12-20 ounces of force when set on a hard level surface. To determine if the tension is correct, lower the drill to the ground. Attach a small hanging scale (i.e. fish scale) to the firmer near the end. Lift until the firmer just comes off the ground. Tighten the tension screw until it takes 20 ounces or 1 1/4 lbs to raise the firmer. Tension should be checked before every season and if tension is weak, tighten screw. For additional information, see Keeton Seed Firmer: Preparation for Planting (955665).

Note: Trim the length of the tail if it is making contact with the Press wheel.



Backing Up tractor while drill is not fully raised can result in damage to the Keeton Seed Firmers.

Storage: Installed Firmers should not be stored touching the ground between planting seasons.

Questions? Check the website: www.precisionplanting.com or call us at 309-925-5050.

Maximum Liquid Capacity

Method	PSI At Firmer	GPM	GPA for 20" Rows				GPA for 30" Rows				GPA for 36" Rows			
			4 mph	5 mph	6 mph	7 mph	4 mph	5 mph	6 mph	7 mph	4 mph	5 mph	6 mph	7 mph
On Seed	5 psi	.47	35	28	23	20	23	19	16	13	19	16	13	11
	10 psi	.73	54	43	36	31	36	29	24	21	30	24	20	17
	Squeeze Pump	.5	37	30	25	21	25	20	16	14	21	16	14	12
Splitter	5 psi	.30	22	18	15	13	15	12	10	9	12	10	8	7
	10 psi	.46	34	27	23	20	23	18	15	13	19	15	13	11
	Squeeze Pump	.33	24	20	16	14	16	13	11	9	14	11	9	8

- ▶ This chart is for reference to maximum flow rates using starter fertilizer (11 lb. per gallon).
- ▶ It is recommended that flow be distributed through an orifice system to ensure equal flow to each row.
- ▶ Pump pressure can be run higher if an orifice is used to regulate flow.

Troubleshooting Guide

Problem	Solution
Firmer not centered in trench.	1 ▶ Check to see if row unit is trailing straight.
Groove worn on side of firmer.	2 ▶ Verify that mounting bracket is installed correctly.
	3 ▶ Check to see that disc openers are shimmed equally.
	4 ▶ Check to see if firmer is bent or damaged.
Starter leaking on closing wheel or firmer.	1 ▶ Make sure hose is connected directly to barb on firmer.
	2 ▶ Check hose for splits at barb or damage from pinching or rubbing.
Uneven starter flow.	1 ▶ Check tubes for kinks or plugs.
	2 ▶ Use manifold with orifice to ensure even distribution.
Dirt builds up on firmers.	1 ▶ Some build-up on firmers is acceptable as long as it is on the sides and top of the firmer, and does not get wider than the V-trench sidewalls.
	2 ▶ If build-up happens on the bottom of the firmer, check for proper tension.
	3 ▶ Check for damage or rough spots on the bottom of the firmer.
Uneven wear on bottom.	1 ▶ Check opener disk contact and shim if necessary.
	2 ▶ Make sure firmer tail is trailing down center of trench.

Warranty: Precision Planting®, Inc. warrants this product to be free from defects in material or workmanship during the first year of service. Our obligation under this warranty shall be limited to repairing or replacing, free of charge to the original purchaser, any part that in our judgment shall show evidence of such defect, provided further that such part shall be returned within thirty (30) days from the date of failure – routed through the dealer from whom the purchase was made. Shipping charges prepaid.

Precision Planting shall have no obligation or liability of any kind on account of any of its equipment and shall not be liable for special or consequential damages. This warranty does not extend to loss of crops, loss because of planting delays or any expense or loss incurred for labor, supplies, substitute machinery, rental or for any other reason. Precision Planting makes no other warranty, express or implied.

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