General Information

Proper servicing and adjustment is key to the long life of all farm equipment. With careful and systematic inspection of equipment, costly maintenance, time and repair can be avoided. The following information will assist with recommended servicing and adjustments:
Unfolding (At Field): The following presumes that the applicator has just completed transport, is raised, and the transport locks are still installed.

1) Remove the wing locking pins

2) Set the FOLD/FIELD switch to FOLD/UNFOLD and extend the fold/lift circuit to unfold the wings.

3) Retract the fold/lift circuit slightly to raise the lift-assist off the transport locks.

4) Set all circuits to Neutral and shut off the tractor.

5) Once the tractor is shut off, remove the lift-assist transport locks and install the depth spacers.

6) If the wing gauge wheels were extended, crank them to field operating height.

7) Lower the hitch until it reaches field ready height also.

Fold Switch Adjustment: During unfold (Fold/Field switch in FOLD), the inner wing sections are intended to stop 0-5 degrees above wings-level relative to the center section. The stopping point is controlled by the vertical proximity sensors LFOSW (1) and RFOSW (2) at each center/wing hinge.

1) Verify that the misalignment is not caused by air in the hydraulic system. Note: Do not use the proximity adjustment to compensate for hydraulic problems.

2) Adjust switches per the dimensions in the illustrations to the right.

3) Set the FOLD/FIELD switch to FOLD and extend the fold/lift circuit to unfold the applicator until the inner wings stop.

4) To adjust the sensor gap, loosen the bolts securing the sensor to the bracket. To adjust the sensor position, loosen the bolts securing the bracket to the frame.

5) Secure the mounting bolts and perform a fold/unfold test to verify the sensor is in the right position.

Fold Switch Adjustment (Round Proximity Switches):

During unfold (Fold/Field switch in FOLD), the inner wing sections are intended to stop 0-5 degrees above wings-level relative to the center section. The stopping point is controlled by a proximity sensor at each center/wing hinge. If a wing does not stop in this range, adjust the proximity sensor.

1) Verify that the misalignment is not caused by air in the hydraulic system. Note: Do not use the proximity adjustment to compensate for hydraulic problems.

2) Set the FOLD/FIELD sensor to FOLD and extend the fold/lift circuit to unfold the applicator until the inner wings stop. Set the circuit to neutral and shut off the tractor.
3) Turn the tractor key sensor to ON so that there is electrical current to the fold proximity sensor. There is a red and green LED in each of the fold proximity sensors.

If no LED is illuminated at any of the fold proximity sensors, check the power source for the tractor.

If neither LED is illuminated at a fold proximity sensor, check the electrical circuit for that fold proximity sensor.

The proximity sensor will illuminate green when power is turned on. If a sensor is activated, it will illuminate red if correctly positioned. If not properly positioned, the sensor will continue to stay green until the gap between the proximity sensor and the actuator is adjusted properly.

4) To adjust the gap, loosen the front adjusting nut at the sensing end of the fold proximity sensor and adjust the rear adjusting nut until the red LED illuminates. **Note:** If the actuator is bolted to the wing, do not adjust the position of the actuator.

To lower the angle at which the wing stops, raise the fold proximity sensor in the sensor mount. Make sure the red LED is still illuminated and tighten the nuts.

To raise the angle at which the wing stops, lower the fold proximity sensor in the sensor mount. Make sure the red LED is still illuminated and tighten the nuts.

5) Fold and unfold the applicator several times to check adjustment.

**Folding:** These following presumes that the applicator is unfolded and lowered in the field ready position.

1) Verify that the wing locking pins are not in the wing rest cradles. They should stored away in the storage tubes.

2) Set the Fold switch to FOLD/UNFOLD and raise the hitch.

3) With the hitch fully raised, retract the fold/lift circuit to simultaneously raise and fold the applicator. Observe the fold sequence as lift and fold do no start and end at the same time.

**Note:** If an abnormal fold is detected, set the fold/lift circuit to Retract. Once the wings are level, set the circuit to Neutral and trouble shoot the problem.

3) Set the fold/lift circuit to Neutral and remove the depth spacers from the lift-assist cylinders. Re-install the transport locks.

4) Insert the wing locking pins to secure the wings during transport.

5) Extend the fold/lift circuit to lower the lift-assist cylinders on the transport locks and then set the circuit to Float.

**Fold Stop Adjustment (Rectangle Proximity Sensors):**
During field fold (Fold/Field switch in FIELD) the inner wings are intended to stop 5-10 degrees above wings-level relative to the center section. The stopping point is controlled by the proximity sensors LFISW (3) and RFISW (4) at each center/wing hinge.

1) Verify that the misalignment is not caused by air in the hydraulic system. **Note:** Do not use the proximity adjustment to compensate for hydraulic problems.
2) Adjust the switches per the dimensions in the illustrations to the right.

3) Set the FOLD/FIELD switch to FOLD and extend the fold/lift circuit to unfold the applicator until the inner wings stop.

4) Set the FOLD/FIELD switch to FIELD and retract the fold/lift circuit until the wings stop at “gullwing” (5-10 degrees above wings-level).

5) To adjust the sensor gap, loosen the bolts securing the sensor to the bracket. To adjust the sensors position, loosen the bolts securing the bracket to the frame.

6) Secure the mounting bolts and perform and fold/unfold test to verify that the sensor is in the right position.

Note: See Technical Information Document (PAUS200G-0002A) for troubleshooting electric/hydraulic fold system.

Fold Stop Adjustment (Round Proximity Switches): During field fold (FOLD/FIELD sensor to FIELD), the inner wing sections are intended to stop 0-5 degrees above wings-level relative to the center section. The stopping point is controlled by an angled proximity sensor at each center/wing hinge. If a wing does not stop in this range, adjust the proximity sensor.

1) Verify that the misalignment is not caused by air in the hydraulic system. Note: Do not use the proximity adjustment to compensate for hydraulic problems.

2) Set the FOLD/FIELD sensor to FOLD and extend the fold/lift circuit to unfold until the inner wings stop.

3) Set the FOLD/FIELD sensor to FIELD and retract the fold/lift circuit until the wings stop at “gull wing”. Set the circuit to neutral and shut off the tractor.

4) Turn the tractor key sensor to ON so that there is electrical current to the fold proximity sensors. There is a red and green LED in each of the fold proximity sensors.

If no LED is illuminated at any of the fold proximity sensors, check the power source for the tractor.

If neither LED is illuminated at a fold proximity sensor, check the electrical circuit for that fold proximity sensor.

The proximity sensor will illuminate green when power is turned on. If a sensor is activated, it will illuminate red if correctly positioned. If not properly positioned, the sensor will continue to stay green until the gap between the proximity sensor and the actuator is adjusted properly.

5) To adjust the gap, loosen the front adjusting nut at the sensing end of the fold proximity sensor. Adjust the rear adjusting nut until the red LED illuminates.

To lower the angle at which the wing stops, raise the fold proximity sensor in the sensor mount. Make sure the red LED is still illuminated and tighten the nuts.

To raise the angle at which the wing stops, lower the fold proximity sensor in sensor mount. Make sure the red LED is still illuminated and tighten the nuts.

6) Fold and unfold the applicator several times.
**Adjusting Weight Transfer:** Adjust the weight transfer system to achieve consistent coulter depth along with keeping the wings level with the center section. If insufficient weight is transferred, outside (wing) coulters may run higher than the center section and if too much weight is transferred, the center section may run too high. Adjust the weight transfer per the following:

1. Unfold the applicator and lower it to the ground. Once on the ground, set the Fold/Field control box to Field.
2. Pull forward until the coulters are in the ground.
3. Set the tractor to half throttle and extend the fold/lift circuit to unfold. Lock the lever for continuous flow.
4. Adjust the tractor flow control valve so that the bypass gauge needle (5) is in the green zone (1000 to 1500 psi).
5. Release the locking disc (6) and adjust the knob (7) until an initial 1800 psi is read on the gauge (8). Re-tighten the locking disc (6).
6. Check that the bypass gauge (5) is still within the green zone. Adjust the tractor remote if any adjustments are needed. Re-check the reading on the pressure-reducing gauge (8).

**Tool Bar Height Adjustment:** When setting the tool bar height for the center section of the applicator, use the tractor’s hitch and lift-assist spacers to assure consistent depth. The height of the wings is controlled by independent gauge wheels on each wing end. Once set, the weight-transfer system assures that the wings are constantly level.

To adjust the tool bar height:

1. Unfold and raise the applicator so that the wing coulters are off the ground and the wings are slightly above level.
2. At each gauge wheel, use the crank (9) to remove tension from the pin (10) that holds the gauge wheel in place. Remove the pin when tension is removed.
3. Use the crank to extend the wheels far enough to keep the wing coulters off the ground. Note: Turn the crank clockwise to lower the wheel, while turning the crank counterclockwise will raise the wheel.
4. Unfold the wings until the gauge wheels are on the ground and then set the fold/lift circuit to Float.
5. Using the 2-point hitch, lower the applicator until the center section coulters are just at ground level.
6. Check the frame level from front-to-back and adjust spacers as necessary on the lift-assist cylinders.
7. Once level, adjust the gauge wheel to bring the wing coulters to the same height as the center section (just above the ground).
8. Measure the length (11) of the exposed gauge wheel tube and crank the wheel to the desired coulter depth. Capture this setting by re-inserting and securing the pin (10). With the pin inserted, crank the wheel up until the tube solidly contacts the pin.
9. At the center section, measure the tool bar height above the ground. Operating height is the frame height minus the desired coulter depth.
10. Pull forward while lowering the 2-point hitch to the desired operating depth. Set a stop on the 2-point hydraulic circuit to capture this height.
11. Adjust the weight-transfer to ensure that the wings stay level at this coulter height.
**Frame Mounted Coulter Adjustment:** Coulters are factory installed and are configured for in-row operation at knife or tine shoe depth. They can be set for fixed or limited caстерing. Coulters depth can be adjusted per the following:

1) Loosen the U-bolt nuts (12) and slide the shaft (13) up or down. Check the coulter-to-knife/tine alignment and re-tighten the nuts.

2) Adjust the coulters to have a running depth at the bottom of the knife or tine shoe. Roughly 3/4 inch below the application depth.

3) For fields that have frequent sharp turns, coulters can be adjusted to pivot at the pivot casting.

4) Loosen the jam nuts along with loosening the set screws just enough to allow the casting to swivel and re-tighten the jam nut. **Note:** Do not remove the center stop screw.

**Vantage I Coulter Height & Castering:** During operation, the coulter height controls the application height and may need to be adjusted for rows behind wheel tracks. Coulters may also be set for rigid row alignment or limited caстерing.

1) The factory setting for coulter height (14) is 7.5 inches from the bottom of the frame to the top of the coulter mount casting.

With a tool bar height of 25 inches (15) above the ground, the disc blade will have a depth of 4 inches (16).

2) For fields where frequent sharp turns are unavoidable, coulter plowing can be reduced by allowing the coulters to caster at the pivot casting.

To adjust, loosen the jam nuts (17) and set screws just enough to allow the casting to swivel. Re-tighten the jam nuts but do not remove the center stop screw.

3) As blades wear, keep the release height (18) constant by raising the applicator weldments on the coulter arm.

Simply loosen the bolts (19) and slide the weldments up as needed. Once the desired position is achieved, tighten the bolts. **Note:** If the application height is still too low after this adjustment, the coulter blades may be worn and in need of replacement.

It is recommended to replace the coulter blade when the initial diameter has been reduced by 1 to 2 inches.
**Terra-Tine Adjustments (Option):** All adjustments are to be made with the applicator in the fully raised position.

1) When the coulter blade is out of the soil, adjust the lock collar height to set the height of the tine fingers flush with the bottom of the coulter blade.

2) Side-to-side alignment can be done by rotating the shank mount around the vertical shaft and re-tightening the square head set screw.

3) Factory setting for a Terra-Tine is a distance of 5.4 inches from the bottom of the frame to the top of the Terra-Tine mount. Height may be adjusted at the mount set screw, or at the frame clamp. Changing the arm angle (20) also changes the tine height.

4) The arm angles are factory set on the lowest down-force setting available (20).

**Terra-Tine Down Force:** A series of three holes in the spring adjuster (21) and pivot mount plate (22) provide five combinations for different levels of spring tension. The following table shows the down-forces available:

<table>
<thead>
<tr>
<th>Position</th>
<th>Terra-Tine Spring Tension (per Tine Disc)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>53 Newtons 12 Pounds</td>
</tr>
<tr>
<td>2</td>
<td>76 Newtons 17 Pounds</td>
</tr>
<tr>
<td>3</td>
<td>98 Newtons 22 Pounds</td>
</tr>
<tr>
<td>4</td>
<td>120 Newtons 27 Pounds</td>
</tr>
<tr>
<td>5</td>
<td>138 Newtons 31 Pounds</td>
</tr>
</tbody>
</table>

**Ground Drive Operations:** When the applicator is lowered to the ground and in motion, the pump begins to operate and fertilizer is applied based on the drive Range sprocket and pump adjuster dial setting.

The following presumes that fertilizer has been loaded into the tanks and the tank is configured and ready for use:

**Priming the Ground Drive System:**

1) On suitable ground, raise the applicator off the ground.

2) With the optional variable rate system, use the SELF TEST feature of the SCS-450 console to simulate a field speed.

3) Wearing gloves, manually rotate the ground drive wheel until material appears at the applicator tubes.

**Ground Drive Field Operation:**

4) Begin field operations and monitor the fertilizer pressure gauge or the PSI display on the optional console.

5) Monitor the fertilizer tank levels while planting to confirm expected consumption rate and to avoid running the pump dry.

6) If residual fertilizer is not recovered at the end of planting, apply it to the last field planted. **Note:** Once finished, always clean out the fertilizer system to avoid corrosion or possible freeze damage.
**Hydraulic Drive Operations:** The output of the pump is under pressure whenever the hydraulic motor circuit is activated. The rate is regulated by a flow control valve and monitored by a flow meter. Both are connected to a Raven SCS 450 console or any other compatible Raven console.

**Hydraulic Drive Start-Up:**
1) Set the console MASTER switch to OFF.
2) Set the console POWER switch ON.
3) Select the FLOW CONTROL RATE1 or RATE2 as desired and verify the rate setting.
4) Set console BOOMS switch 1 ON.
5) Set the flow rate for the hydraulic remote.
6) Activate the circuit by moving the hydraulic level to the Retract position. The pump will then be activated but with the MASTER switch OFF, there will be no material flow.
7) Set the MASTER switch to ON and check for material flow at the tines. Prime the second hydraulic pump as required.
8) Begin field operations and monitor the fertilizer pressure gauge or PSI display on the optional console.

**Hydraulic Drive Field Operations:**
9) Monitor the fertilizer tank levels while planting to confirm expected consumption rate and to avoid running the pump dry.
10) If residual fertilizer is not recovered at the end of planting, apply it to the last field planted. **Note:** Once finished, always clean out the fertilizer system to avoid corrosion or possible freeze damage.

**Material Clean-Out (Liquid):** Fertilizers are usually highly corrosive to metals other than stainless steel. Suspension fertilizers can clog components during storage so it is important to protect the pump, tanks, strainers, lines and nozzles per the following:
1) Flush the entire system with clean water.
2) While flushing the system, remove all the end caps from the booms to ensure that the booms are properly flushed as well.
3) Remove the strainer and drain all contents along with draining all the lines and tanks to prevent freeze damage.
4) Once the applicator has been completely flushed, wash off any fertilizer that may be stuck on the applicator.