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:
Hydraulic Pump Setup:

Note: These steps assume that water has been added to the sprayer tank and pump.

To determine the correct flow rate to the hydraulic motor, start with the hydraulic control valve set at a minimum flow, and the hydraulic lever in the float position.

1) Open up the sprayer control valve to its maximum setting. To open the valve, the Raven SCS 450 Monitor must have the Power switch (1) on. Then, the Rate switch (2) must be placed in the manual position, and the increase/decrease switch (3) must be pushed to Increase for 10-12 seconds.

2) Start the tractor and engage the pump by placing the hydraulic lever in the down position. Once the system builds pressure on the nozzle pressure gauge, speed up the tractor throttle to normal operating speed.

3) Shut off the boom section switches and close the agitation valve.

4) The pump is now at deadhead pressure and the hydraulic control valve must be adjusted up until the spray pressure reaches 80 psi maximum on the nozzle pressure gauge. Mark this setting on the hydraulic control valve for future reference.

5) Open up the agitation valve.

PTO Pump Setup:

1) Open up the sprayer control valve to its maximum setting. To open the valve, the Raven SCS 450 Monitor must have the Power switch (1) on. Then, the Rate switch (2) must be placed in the manual position, and the increase/decrease switch (3) must be pushed to Increase for 10-12 seconds.

2) Start the tractor and engage the pump by placing the hydraulic lever in the down position. Once the system builds pressure on the nozzle pressure gauge, speed up the tractor throttle to normal operating speed.

3) Shut off the boom section switches and close the agitation valve.

4) The pump is now at deadhead pressure. Increase the engine RPM’s until the spray pressure reaches 80 p.s.i maximum on the nozzle pressure gauge or until the PTO speed reaches the rate RPM (540/1000). Note: Never exceed the rated tractor PTO RPM. This is the RPM needed to spray at to prevent excess pressure on the sprayer’s plumbing.

5) Open up the agitation valve.
Axle Wheel Spacing Adjustment:
Axles extensions can be adjusted for differing row spacings.
Note: Do not change the fore/aft position of the axle mount. Moving the axle forward may result in negative tongue weight even when folded. Moving it aft increases positive tongue weight and may result in tire to boom contact.

1) Hitch the sprayer on level ground.

2) Measure the current wheel spacing between tread center-lines. Note: Also measure the distance from the outer end of each axle to the mount. Keep these measurements equal, or the sprayer will pull skewed.

3) Compute the difference between the current and desired spans. Divide it by two and this is the amount to extend or retract each axle.

4) Using a hoist or jacks at the left rear corner of the main-frame, raise the sprayer until the tire on that side is slightly elevated off the ground.

5) Loosen the bolts (4) joining the upper and lower axle mounts, starting with the bolts nearest the wheel being adjusted. Loosen only enough bolts to allow movement of the axle to be adjusted.

6) Slide the axle either in or out depending on the desired span. Note: Do not adjust the wheel spacing wider than 120 inches (305cm) on North American models, or 290 cm (114 inches) on export models at tire tread centers. Doing so may result in axle failure during service.

7) Once the desired span is achieved, secure the four bolts nearest the tire and lower the machine.

8) Repeat steps 5 through 8 for the opposite side.

Break Away Spring Adjustment:
If an outer boom arm strikes an obstruction, a pair of spring-loaded rollers ride up and out of a detent, allowing the arm to pivot back and upward. The arm usually re-seats itself automatically but if it does not:

1) Stop the tractor and set the parking break.

2) Set the hydraulic pump circuit to Float or shut down the PTO.

3) Wearing gloves, swing the arm forward until the rollers are back in detent. Periodically check that the break-away springs are compressed to 5 1/2 inches. If the spring is not at the desired dimension, adjust the spring by turning the mounting nut (5) under the spring.
Shear Bolts:
Great Plains sprayers are equipped with four shear bolts to help prevent damage to the booms. These are located at the inner boom pivot posts at the end of the center section. When the boom encounters an obstruction, both bolts on that side fail, allowing the boom to swing back.

If a pair of shear bolts break, replace them with a pair of 5/8-11 x 3 inch Grade 5 bolts (#802-160C). If this size and grade bolt is not immediately available, temporarily substitute it with a metric M14x2 Class 8.8 bolt.

Using a lower grade/class bolt causes nuisance shears while using a higher grade/class bolt may result in serious equipment damage.

Note: Inspect these bolts at the start of the spraying season to ensure that the bolts have not been weakened through use or rusting.

Leveling Booms:
Note: The boom sections must be level across the span for even spraying.

To adjust the inner arm:
1) Completely unfold the sprayer and place supports under the booms.
2) Loosen but don’t remove the four bolts holding the plates at the top of the pivots, located between the center section and the inner boom arms.
3) Add or remove shims as necessary. Additional shims are available from Great Plains as part number 506-826D.
4) Once the booms are level, re-tighten the bolts.

Main Tank Fill Using Sprayer’s Pump:
Check that all shutoff and clean out valves are in their “normal” positions for field operation. Set all boom switches to Off.
1) Close the ball valve at the main tank inlet.
2) Set the panel valve (1) to OFF.
3) Set the panel valve (2) to MAIN TANK.
4) Set the inductor valve (3) to TANK FILL
5) Connect the supply hose to the quick-fill Cam-Lock coupler.
6) Turn on the water and open the quick-fill valve.
7) Start the sprayer pump. Stop filling by first turning off the pump, then closing the inlet valve.
Main Tank Fill Using Supply Pump:

1) Close the ball valve at the main tank inlet.
2) Set the panel valve (2) to MAIN TANK.
3) Set the panel valve (3) to SPRAY.
4) Connect the supply hose to the quick-fill Cam-Lock coupler.
5) If using gravity or a pump that is not positive displacement, turn on the water source and open the quick-fill ball valve.
6) If using a positive displacement pump, turn it on.
7) When the tank is filled to the required level:
   - If using a gravity or a pump that is not positive displacement, close the inlet ball valve, then shut off the water source.
   - If using a positive displacement pump, shut off the pump, and then close the inlet ball valve.

Inducting Chemicals (Option):

Note: Always turn the pump on before opening the inductor shutoff valve. Always turn the pump off before closing the inductor shutoff valve. If the pump is not running, the tank can drain back through the inductor.

1) Check that the inductor-outlet/tank-inlet is open.
2) At the inductor valve, set valve (6) to OFF and valve (7) from OFF to INDUCT.
3) Set the panel valve (1) to AGITATE
4) Set the panel valve (2) to MAIN TANK
5) Set the panel valve (3) to SPRAY
6) Be sure that the valve to the tank is open and start the pump. Note: The pump recirculates tank contents through a venturi beneath the inductor tank.
7) Open the inductor lid. Note: The inductor lid is vented, and the inductor may be operated with the lid on or off.
8) Open the inductor shutoff valve (6) and inspect to ensure that there is no back-flow of water from the tank into the inductor.
9) Add the chemical to the inductor tank. When the required amount of chemical has been added, and the inductor tank is empty, close the inductor shutoff valve (6).

Agitation:

The agitator system bleeds off some of the material flow and recirculates it through quad jet orifices at the bottom of the tank. This helps maintain constant concentration with materials that might otherwise tend to precipitate, sediment or stratify.

The agitation valve (1) adjusts the pressure to the agitation nozzles in the tank when set to positions between OFF and AGITATION.

Refer to the agitation gauge, and adjust the pressure to a desired rate. Different chemicals require different agitation pressures to keep the chemical in suspension.
Tank And Boom Flush:

The Tank Rinse and Flush features use the fresh water in the 100 gallon flush tank to rinse out the main sprayer tank and boom in the field.

Before operation, make sure the Flush tank is filled with fresh, clean water.

1) Completely empty the chemical in the main sprayer tank by turning the agitation off on the last pass and spraying the main tank contents out in the field. To avoid overdosing, use a higher ground speed or lower application rate.
2) Make sure that all boom valves and pump are turned off.
3) Set the panel valve (1) to FLUSH
4) Set the panel valve (2) to FLUSH TANK
5) Set the panel valve (3) to SPRAY
6) Operate the pump with the sprayer stationary, and rinse the tank until 1/3 of the flush tank volume (33 gallons or 126 liters) is consumed and then stop the pump.
7) With the sprayer pump turned off, turn the agitation valve (1) from FLUSH to OFF.
8) Rotate the tank valve from FLUSH TANK to MAIN TANK.
9) Repeat steps 2 through 7 twice more until the flush tank is empty and the main sprayer tank and boom has been rinsed completely three times.
10) Reset the agitation pressure before filling the main sprayer tank.

Clean Out Tank Fill Filter Maintenance:

Note: Wear chemical gloves and protective clothing when handling filters. Although used for adding clean water, the chemical mix in the main tank can back-wash into this assembly.

1) Start with an empty sprayer tank.
2) Position a bucket under the plug (8) in the sump cap (9) of the filter. Remove the plug and allow the grit to fall out.
3) Screw the plug back in using a pipe thread sealant to seal the plug.
4) Dispose of the grit and water in the same manner described on the manufactures label of the latest chemical used in the sprayer.

If draining the filter does not improve slow:

5) Unscrew the entire sump cap and remove it slowly while saving the gasket.
6) Remove the filter element (10) and clean or replace it.
7) Re-assemble the filter. No thread sealant is required on the main cap threads.