

Pre-season Service for All Commander II Systems (see following pages for special service for PumpRight and electric pump systems)

(A little time spent here may prevent some downtime when you want to be rolling.)

1. Visually check entire system (hoses, fittings, harnesses, etc.) for any signs of wear or trouble. If connectors, harnesses, or parts have been soaked in fertilizer, check these very carefully.
2. Particularly check all connectors on systems that have been in use. Be sure pins are clean, not corroded, and are making good contact. Corroded pins need to be replaced. Cleaning will not restore good electrical contact. If the pin has corroded, a lot of time the corrosion extends to the first part of the wire. If there is much corrosion, consider replacing the cable. Newer style cables have Deutsch connectors that seal better than the round AMP connectors.
3. Check the flow indicators for cracks and clarity. They can become weathered and difficult to see through.
4. On the display, recheck all setup screens – Calibration mode and Special Cal (see Section F of the manual) to verify correct setup.
5. Raise and lower the implement to verify that the height switch (if being used) arrow is indicating correctly on the display by the RUN/HOLD indicator.
6. Fill system with water and run in Manual mode to verify components and system are in working order. (May need to open air bleed valve to prime pump the first time. Be sure the air bleed valve is not plugged. Be sure recirculation knob is closed.) In this test, you should be able to speed the pump up and slow it down with the (+) and (-) button. (See the page on Commander II Startup Procedure and Troubleshooting.) Verify that all sections open and close (and in the correct order) with the section toggle switches on top of the Commander II.
7. Tighten all clamps. Loose clamps may be evident by leaks on the output side of the system. Loose clamps from the tank to the pump are not always apparent but can be sources of air getting into the system which can create issues.
8. Push in all QuickConnect (QC) fittings to be sure the tubes are tightly seated. Unseated QC fittings may not leak but they can cause check valves to leak because they allow air to be drawn into the system when application stops.
9. Remove the blue or black cap from the top of each check valve. Check the diaphragm to be sure it is intact and not gummed up with residue. Look under the diaphragm for debris. Compress the spring in the cap to be sure it moves freely. Carefully replace diaphragm and tighten cap. These check valve fairprene diaphragms (133-03-40155-07) and the O-ring (133-03-40160) in the check valve should be replaced every year or two for best performance.
10. Remove and clean the strainer. Be sure strainer is tightened securely so it will not suck air. Check the housing for cracks.
11. Be sure all rows are flowing and that all metering tubes/orifices are open. (Note: It will take a higher flow rate with water to create enough pressure to open all the check valves so that each row will flow.)
12. Run system with an AUTO test with speed and rate to be used in the field. (See the page on Commander II Startup Procedure and Troubleshooting.)
13. While the test is running, go to Volume/min to observe flow in GPM and to Pressure.
14. It is good to run a catch test to verify flowmeter operation. This can be done using Manual test or the AUTO test. If the amount caught is close to what it should be, do not change the Flowmeter calibration number unless you have repeatedly done accurate tests that indicate a change should be made. The flowmeters are generally very accurate with the factory flow calibration number and should not be changed unless very accurate data indicates it should.
15. Check the placement devices for wear and alignment. Check tension on Keeton seed firmers.

16. See the preseason checklist specifically for Tower (Electric pump) systems and PumpRight (Hydraulic pump) systems for more items.

Use Flow Simulator (219-01462) or Tap Tester tool (212-03-3912Y1) to verify harnessing.

Use Pressure Simulator (212-03-3910Y1) to verify harnessing and setup and to change LiquiShift valves.

All techs and end users should watch the videos at the following link. Many of these are specifically for the John Deere controller, but some apply to all systems. Currently there are 8 videos (2 to 6 minutes each). You can watch the whole set in 30 minutes.

https://www.youtube.com/playlist?list=PLKqJgQzi_FVKJ8qbmTelo3cxhVCFqI9Ab

Techs and end users should have and should read these Troubleshooting/Service Guides:

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<http://www.surefireag.com/cms/images/Commander-II-Tech-Tips.pdf>

<http://www.surefireag.com/cms/images/396-4256Y1-Commander-II-Startup-and-Tests-for-Dummies.pdf>

<http://www.surefireag.com/support> Full manuals, QuickStart Setup Guides, and Troubleshooting Guides are available here.



Pre-season Service for Commander II PumpRight (Hydraulic Pump) Systems

(A little time spent here may prevent some downtime when you want to be rolling.)

1. Visually check entire system (hoses, fittings, harnesses, etc.) for any signs of wear or trouble. If connectors, harnesses, or parts have been soaked in fertilizer, check these very carefully.
2. Particularly check all connectors on systems that have been in use. Be sure pins are clean, not corroded, and are making good contact. Corroded pins need to be replaced. Cleaning will not restore good electrical contact. If the pin has corroded, a lot of time the corrosion extends to the first part of the wire. If there is much corrosion, consider replacing the cable. Newer style cables have Deutsch connectors that seal better than the round AMP connectors.
3. Check the flow indicators for cracks and clarity. They can become weathered and difficult to see through.
4. Change the pump oil annually. Use SAE 30 Non-Detergent Oil. SureFire has Hypro Oil specifically for these pumps.
5. On the display, recheck all setup screens – Calibration mode and Special Cal (see Section F of the manual) to verify correct setup.
6. Raise and lower the implement to verify that the height switch (if being used) arrow is indicating correctly on the display by the RUN/HOLD indicator.
7. **Clean out the dirt that may be packed into the manual override knob on the hydraulic valve block.** May need to use a spray like WD-40 or compressed air to get the dirt out. You should be able to push down and rotate the knob a half turn counterclockwise, and have it pop up (to open the manual override) and then be able to push it down and turn it a half turn clockwise to lock it in operating position. If the stem is packed full of dirt, forcing the knob to turn with a pliers can break the stem. When the knob has been pushed down and rotated counterclockwise, there should be about ¼" movement in the stem with heavy spring tension.
8. If necessary, run pump in manual override mode to check hydraulic setup. This involves turning the hydraulic flow to 1, popping up the manual override knob, opening the section valves, and then turning on the hydraulic flow. The pump will be controlled by adjusting the hydraulic flow.
9. Fill system with water and run in Manual mode to verify components and system are in working order. (May need to open air bleed valve to prime pump the first time. Be sure the air bleed valve is not plugged. Be sure recirculation knob is closed.) In this test, you should be able to speed the pump up and slow it down with the (+) and (-) button. (See the page on Commander II Startup Procedure and Troubleshooting.) Verify that all sections open and close (and in the correct order) with the toggle switches on top of the Commander II.
10. Tighten all clamps. Loose clamps may be evident by leaks on the output side of the system. Loose clamps from the tank to the pump are not always apparent but can be sources of air getting into the system which can create issues.
11. Push in all QuickConnect (QC) fittings to be sure the tubes are tightly seated. Unseated QC fittings may not leak but they can cause check valves to leak because they allow air to be drawn into the system when application stops.
12. Remove the blue or black cap from the top of each check valve. Check the diaphragm to be sure it is intact and not gummed up with residue. Look under the diaphragm for debris. Compress the spring in the cap to be sure it moves freely. Carefully replace diaphragm and tighten cap. These check valve fairprene diaphragms (133-03-40155-07) and the O-ring (133-03-40160) in the check valve should be replaced every year or two for best performance.
13. Remove and clean the strainer. Be sure strainer is tightened securely so it will not suck air. Check the housing for cracks.
14. Run system with an AUTO test with speed and rate to be used in the field.

15. Be sure all rows are flowing and that all metering tubes/orifices are open. (Note: It will take a higher flow rate with water to create enough pressure to open all the check valves so that each row will flow.)
16. While the test is running, go to Volume/min to observe flow in GPM and to Pressure.
17. It is good to run a catch test to verify flowmeter operation. This can be done using Manual test or the AUTO test. If the amount caught is close to what it should be, do not change the Flowmeter calibration number unless you have repeatedly done accurate tests that indicate a change should be made. The flowmeters are generally very accurate with the factory flow calibration number and should not be changed unless very accurate data indicates it should.
18. LiquiShift valves will not open until there is a PWM signal. This can be done with the Manual or Auto test.
19. Check the placement devices for wear and alignment. Check tension on Keeton seed firmers.

Use Flow Simulator (219-01462) or Tap Tester tool (212-03-3912Y1) to verify harnessing.

Use Pressure Simulator (212-03-3910Y1) to verify harnessing and setup and to change LiquiShift valves.

All techs and end users should watch the videos at the following link. Many of these are specifically for the John Deere controller, but some apply to all systems. Currently there are 8 videos (2 to 6 minutes each). You can watch the whole set in 30 minutes.

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Pre-season Service for Commander II Tower (Electric pump) Systems

(A little time spent here may prevent some downtime when you want to be rolling.)

1. Visually check entire system (hoses, fittings, harnesses, etc.) for any signs of wear or trouble. If connectors, harnesses, or parts have been soaked in fertilizer, check these very carefully.
2. Particularly check all connectors on systems that have been in use. Be sure pins are clean, not corroded, and are making good contact. Corroded pins need to be replaced. Cleaning will not restore good electrical contact. If the pin has corroded, a lot of time the corrosion extends to the first part of the wire. If there is much corrosion, consider replacing the cable. Newer style cables have Deutsch connectors that seal better than the round AMP connectors.
3. Check the Power Cable connection at the battery and at the hitch. If these have 480 MP connectors, consider upgrading the connectors to the Anderson connectors and possibly upgrading the full power harness and extension to the new heavier duty cables. The biggest problem with electric pump systems is when we get low voltage at the EPD because of the length of the cable necessary to get there. The heavier duty cables (6AWG wire) with the robust Anderson connectors helps to reduce the voltage drop. On EPDs with the Anderson connectors there is a Voltage Test connector. Test the voltage here when the pumps are running.
4. Check the flow indicators for cracks and clarity. They can become weathered and difficult to see through.
5. On the display, recheck all setup screens – Calibration mode and Special Cal (see Section F of the manual) to verify correct setup.
6. Raise and lower the implement to verify that the height switch (if being used) arrow is indicating correctly on the display by the RUN/HOLD indicator.
7. Fill system with water and run in Manual mode to verify components and system are in working order. (May need to open air bleed valve to prime pump the first time. Be sure the air bleed valve is not plugged. Be sure recirculation knob is closed.) In this test, you should be able to speed the pump up and slow it down with the (+) and (-) button. (See the page on Commander II Startup Procedure and Troubleshooting.) Verify that all sections open and close (and in the correct order).
8. Check the operation of each pump individually. Run the Manual Test with one pump at a time and verify the flow output (GPM) of each pump.
9. Tighten all clamps. Loose clamps may be evident by leaks on the output side of the system. Loose clamps from the tank to the pump are not always apparent but can be sources of air getting into the system which can create issues.
10. Push in all QuickConnect (QC) fittings to be sure the tubes are tightly seated. Unseated QC fittings may not leak but they can cause check valves to leak because they allow air to be drawn into the system when application stops.
11. Remove the blue or black cap from the top of each check valve. Check the diaphragm to be sure it is intact and not gummed up with residue. Look under the diaphragm for debris. Compress the spring in the cap to be sure it moves freely. Carefully replace diaphragm and tighten cap. These check valve fairprene diaphragms (133-03-40155-07) and the O-ring (133-03-40160) in the check valve should be replaced every year or two for best performance.
12. Remove and clean the strainer. Be sure strainer is tightened securely so it will not suck air. Check the housing for cracks.
13. Run system with an AUTO test with speed and rate to be used in the field.
14. Be sure all rows are flowing and that all metering tubes/orifices are open. (Note: It will take a higher flow rate with water to create enough pressure to open all the check valves so that each row will flow.)
15. While the test is running, go to Volume/min to observe flow in GPM and to Pressure.
16. It is good to run a catch test to verify flowmeter operation. This can be done using Manual test or the

AUTO test. If the amount caught is close to what it should be, do not change the Flowmeter calibration number unless you have repeatedly done accurate tests that indicate a change should be made. The flowmeters are generally very accurate with the factory flow calibration number and should not be changed unless very accurate data indicates it should.

17. Check the placement devices for wear and alignment. Check tension on Keeton seed firmers.

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Commander II Startup Procedure and Troubleshooting Testing

Be sure the harnessing is plugged in correctly. The cable from the Astro speed sensor must be plugged into the connector with the Yellow zip tie. If it is plugged into the Gray zip tie, as soon as you start driving, the Commander will have a fast, clicking sound and it will switch quickly and repeatedly between RUN and HOLD as the pulses from the speed sensor change the system from RUN to HOLD and back quickly.

There is also a place on the implement where connections can be made wrong. If the RUN/Hold connector on the implement is plugged into the flowmeter, as soon as product starts flowing, the pulses from the flowmeter will make a fast clicking sound on the Commander II as the system switches between RUN and HOLD.

There are two basic tests for the Commander II when doing a pre-season check or when doing any other troubleshooting.

The first test is the **MANUAL test**. In this test, we will turn the pump on, speed it up, and slow it down. During this test we can observe flow (Volume/min-(GPM)) and pressure.

To run the MANUAL test:

1. Put the Commander II in MANUAL mode (MAN) by pushing the AUTO/MAN button.
2. Put the dial at Volume/min (that's 2nd from the top on the left side).
3. Put the system in RUN (it must NOT say HOLD on the screen). First, put the Run/Hold switch in Run. Lower the implement or turn the mercury switch or unplug it.
4. If it is a hydraulic pump, turn on the hydraulic flow to the pump.
5. Turn on Boom 1. The section valve should open. (You can also turn on Boom 2 and Boom 3 if desired.)
6. Press and hold the (+) button. The pump should start running, liquid should start flowing, and there should be a reading on the screen in GPM.
7. You can turn the dial to Pressure to see what that is. (If you are testing with water, the pressure will be much lower than it will be with a heavier and thicker fertilizer product.)
8. Turn boom switches off to stop the test.

The second the is the **AUTO test**. In this test we will simulate driving through the field with the system automatically locking on to the target rate.

To run the AUTO test:

1. Go to CALIBRATION mode by pressing and holding the CAL button until the red light comes on.
2. Push the AUTO/MAN button until the screen says AUTO.
3. Turn the dial to SPEED (that's in the lower right corner). Press the (+) button to set the desired speed.
4. Turn the dial to RATE. Verify that the correct Target Rate is showing. If necessary, use (+) or (-) to set the desired rate.
5. Turn the RUN/HOLD switch to RUN. If necessary, lower the implement, turn the mercury switch or unplug the mercury switch so the system is in RUN mode, not HOLD.
6. Turn at least Boom 1 on.
7. The pump should start. It should lock on to the desired rate. You can press (+) or (-) to increase or decrease the rate.
8. You can turn the dial to speed to change the speed.
9. You can turn the dial to pressure to read this. (Pressure will be much lower with water.)
10. You can turn the dial to 'Volume/Minute to see how many GPM are being pumped.
11. Turn the boom switches off. Press and hold CAL to turn off the red light.

In the field, set the system to AUTO, put the dial on RATE, switch to RUN, turn on the boom switches, lower the implement, and drive.

Go to <http://www.surefireag.com/support> for more troubleshooting information and complete system manuals.