

## **vApplyHD systems - How to set the stroke of a piston pump prior to the pump calibration procedure**

It is important to properly set the stroke of a piston pump PRIOR to calibration of the pump for a vApplyHD system. The reason for this is a pump set with too low of a stroke will have to run excessively fast causing increased pump wear and/or inability to hit the target rate. A pump set with a too high of stroke will run very slowly and have increased pressure spikes and poor pressure stability making it more difficult for the vApplyHD modules to control the rate accurately.

The proper setting will be in the middle of the RPM range of the pump, calculated at 110% of the maximum flow needed.

To calculate the maximum flow needed use the following formula.

1. Maximum application rate (GPA) x maximum speed (mph) x row width (inches) = Y.
2. Y divided by 5940 = GPM per row.
3. GPM per row x # of rows = GPM max for the implement.
4. GPM max x 110% = Setpoint needed for the pump.

Now you want to set the pump in the middle of the range of RPM so that the pump is not running too fast or too slow. If you have a wide range of speed and/or application rates, that may change where you choose to set the pump so it isn't running too slowly at the minimum application rate and speed as well.

Once you have these numbers, use the resources available for your pump model to find the correct pump stroke setpoint.

Here is the website for the calculators for John Blue pumps if you do not have the manual calculator available.

<https://johnblue.com/calculators/hydraulic-drive-piston-pump-rpms/>

Here is an example of this process

1. 20 GPA max rate x 5.5mph max speed x 30" row width = 3300.
2. 3300 divided by 5940 = 0.5556 GPM per row
3. 0.5556 x 16 rows = 8.889 GPM max for the implement.
4. 8.889 x 110% = 9.78 GPM setpoint needed for the pump.

The example planter has a John Blue NGP-6050 pump driven with a John Deere hydraulic seeding drive at a 1:1 gear ratio. The pump has a maximum output of 21 GPM at 450 maximum RPM and a minimum recommended RPM of 100.

Using the calculator on their website for "Hydraulic Drive Piston Pump RPM Calculator" I get results showing the following.

Pump setting 10 = 189 RPM

Pump setting 9 = 212 RPM

Pump setting 8 = 234 RPM

Pump setting 7 = 270 RPM

Pump setting 6 = 315 RPM

Pump setting 5 = 378 RPM

Pump setting 4 = 473 RPM OUT OF RANGE

Therefore I am going to choose a pump stroke setting of approximately 7. This will allow to hit the highest rates without the pump running too fast, and should allow the pump to slow down some when planting at lower rates and speeds (also the pressure relief bypass valve will allow extra flow to return when not used).

**Note: Ground Drive Pumps**

If your pump is ground driven rather than hydraulic drive, it is important to set the pump for 110% of the maximum flow that will be required. Use the resources available from the pump manufacturer to determine this setting.