A man wearing a hard hat and safety vest is working on the engine of a John Deere planter. The image is overlaid with a green tint. The text 'PLANTER MAINTENANCE GUIDE' is centered in white, bold, uppercase letters. The background shows various hoses and mechanical parts of the engine.

PLANTER MAINTENANCE GUIDE

Make sure your planter is tuned for maximum performance.

Row crop planters are incredible machines. Just think what the row-unit is doing every second that you go through the field. First, it has to clean residue away from in front of the row-unit. Then it needs to open a furrow, hold that furrow open, place each seed in the furrow, apply fertility, and then close that furrow back up as if you'd never been there before. All of this while planting 14 seeds or more per second, providing you that perfect spacing you're looking for in the field.

Just like a high-performance car needs to be tuned before every race for maximum performance and to give that driver an edge, your planter needs to be tuned before every planting season to give you that edge to where you're setting up each field for maximum possible yield and the best profitability that you've ever had.

We want to give each seed that you place in the ground the best opportunity to win, so we've created a video series as well as this guide to highlight 15 areas where issues can arise that lead to poor planting.

For more in-depth discussions and demonstrations

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1

Row Cleaners



Row cleaners are a must for your planter. You want to make sure you remove residue so that your seed is only in contact with soil.

In order to check your row cleaners, you first want to spin them. Make sure that you don't have any loose bearings. You're also going to check the frame of the row cleaner, ensuring that your pivot bushings are tight. If any of those maintenance items need to be taken care of, you'll want to address them before planting season.

The tine or spike style of row cleaner is intended to be used in tillage conditions, whereas the razor wheel or shark tooth, as some call it, style of row cleaner is intended for those no-till conditions where you're cutting into residue on the surface and sweeping it away.

2

Parallel Arm Bushings



There are many different options available for you when you're doing parallel arm maintenance on your planter, including new OEM components or aftermarket solutions, including kits from SI Distributing for parallel arms, or Highland Machining's replaceable bushing kit. Harvest International also has a complete parallel arms set.

The parallel arm linkage makes sure that the row-unit is riding smoothly through the field. If there's wear in these components, you'll see that you have inconsistent depth which will lead to inconsistent emergence. It will affect spacing due to chatter in the row-unit as the planter travels through the field.

The components we're focusing on here are the upper and lower parallel arms and all of the parts attaching them to the row-unit.

To check for wear, move the row-unit vertically from the back, checking for vertical movement and move the row-unit horizontally, checking for horizontal movement. If you're not sure if these components have too much wear on them, replace the components of one row and compare.



3

Keeton Seed Firmer



When a seed comes down the seed tube and into the furrow, you want it to get to the bottom of the furrow, not be hung up with an air pocket underneath it. A Keeton® Seed Firmer on each row will press the seed down to the bottom of the trench to get into moisture, helping you achieve consistent germination.

Keeton Seed Firmers are available in standard and low-stick options (for use in wet/tacky soils). All firmers can be used with a liquid tube for in-furrow starter application.

Firmer Maintenance - It's important to check the condition and tension of your firmer. Check the shape to make sure it's riding in the bottom of the trench, and replace if it's worn into a V shape. You can check the tension of the firmer using a fish scale. Take a string, drop it down and loop around the firmer, and pull up. If you don't reach 20 ounces of tension, you are not firmly pressing the seed into the trench, and need to replace the firmer. Some variations of the Keeton Seed Firmer allow for extra tension to be placed on the firmer by tightening a bolt on the back.

4

Seed Tube



Get a tape measure and measure your guards. You want your guards to be at least $\frac{3}{4}$ of an inch wide at the start of a new season. If it's less than that it's time to replace that seed tube guard with a new one, which is $\frac{15}{16}$ inches wide. You should always replace the seed tube guards when you're putting a new set of opener disks on the planter.

As your planter goes through the field, the disk opener can contact the bottom of the seed tube. For good spacing in the field, you want to inspect your seed tubes and make sure there's no wear at the bottom.

The BullsEye® seed tube has a tungsten carbide tip wear insert at the bottom that helps extend the life of this seed tube. If you do have wear on your seed tubes, ask your local Precision Planting Premier dealer for replacement BullsEye seed tubes. You also want to take a look at the seed tube guards. If your seed tube guard gets worn, you're going to see wearing of the seed tube and poor furrow creation. Remember, you want to get the seed all the way to the bottom of the furrow for good seed to soil contact for consistent emergence.



5

Disk Openers



Disk openers create the furrow that seeds are placed in. To make sure that this process happens properly, you have to keep up with maintenance. Disk openers that are not maintained properly will cause erratic emergence and lost yield.

Diameter - Once disk openers wear 1/2" from their original diameter, they should be replaced. Continuing to utilize worn disk openers will wear out the seed tube guard.

Contact - For most row units, the disk openers should have 1-2 inches of contact so they clear out all of the soil they encounter, leaving a V-shaped furrow. Too little contact will cause depth inconsistencies and late emergence of some plants. Two business cards can be utilized

to set correct contact points. Bring a business card in from the bottom side until it catches. Then bring one in from the top side until it contacts. If you can pull that business card all the way through, then you know you need to remove shims from the inside and bring the disk in tighter. In the event that you have too much contact, you can add shims.

Once you get your pinch point you can use something like a Sharpie marker to make your mark and rotate it around to be sure that you have the proper contact in 3 different points on the disk blade.

On a Case IH Early Riser planter, the offset disk openers should have no more than an 1/8" gap between them. Case IH planters also have a furrow forming point that creates the furrow right behind the offset disks. If the forming point is worn, you will have a shallower depth than what your adjustment lever is set at. Purchase a furrow firming point gauge from your local Case IH dealer. Hold it up to the back of the point, and if the point does not show in the window, it is time to replace it.

6

Gauge Wheel Shimming



Uniform emergence means that every single seed needs to be in the same moisture environment. One part of the planter that can affect this negatively is poor shimming of the gauge wheel.

To check this, you want to lift the gauge wheel up to the planting position and then pull away. Check for slop in the gauge wheel arm and see if they're worn out. If they are, you can replace them with new components, either aftermarket or go to your OEM to source those parts.

Once you have good parts or new parts installed, you want to shim this gauge wheel in so that there's a tight seal between the gauge wheel and the disk opener. It should still rotate freely, but there should be a scrubbing action between the two of them. This scrubbing action keeps the dry soil on the surface from caving into the trench resulting in delayed emergence.

7

Depth Adjustment Linkage



It's very important to check the following components of the depth adjustment linkage for wear:

- Depth Adjustment Handle
- Depth Stop
- Gauge Wheel Arm

If you look at a gauge wheel arm and it has a divot in it or missing material, and there's a lot of wear on the depth stop or a lot of slop back and forth, you have a problem. If you set your depth adjustment handle to 2 inches, it's possible that you could be planting at 2 ³/₄ inches and not even know it.

It's important to note that your planter may not have a depth adjustment linkage that looks exactly like the one shown here, but all planters work on the same or similar concept where we have a stop and metal on metal that's going to wear differently across the whole planter.

8

Closing Wheel Spacing & Alignment



Once the seed is placed in the furrow, it is important to make sure that the furrow is closed back up with good seed to soil contact.

Alignment - To check for proper alignment you're going to begin by feeling for any excessive side-to-side motion, which indicates that it's time to check the bushings and mounting holes of the closing tail and possibly replace them. Once you have the closing tail tightly aligned, set the planter down on a pad of concrete and roll forward about 3 feet and make a mark. Look behind each row unit and make sure the wheels are centered over the mark; if they are not centered, adjust so that they are.

Distance - The distance between the closing wheels ensures that you're going to get the best closure of the trench possible. Too narrow will

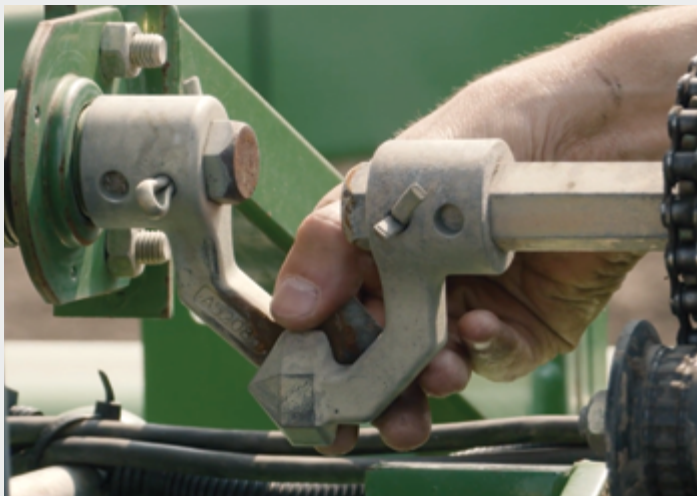
tend to pinch the top of the trench but leave an air gap around the seed, which will delay emergence. Too wide risks leaving an open furrow. 2 ½ inches from bottom center to bottom center tends to center those forces down the edge of each sidewall and completely encapsulate that seed in the moisture beneath, at typical corn planting depths.

Pressure - You can determine whether or not you can maintain the right amount of pressure in order to actually close the trench by taking a bathroom scale and sliding it underneath each row unit. Next, put each closing tail on the same notch, and lower the planter. Be sure that each spring is still in good condition and applying the same amount of tension. If you see that you're getting a significant difference from row-to-row, it may be time to change out the springs.

Once you get to the field, use something like a pocket knife or a hand hoe to go in and cut a cross-section of the trench. Pull it towards yourself and ensure that you've gotten rid of any air gaps around the seed without over closing the furrow.

9

Meter Drive System



Vibration caused by mechanical components like chains and sprockets can take a properly performing meter and cause it to create skips, doubles, and spacing errors. Be sure to check the following components for wear:

Chains & Sprockets - Keep properly lubricated. We recommend replacing chains annually. Also, check the teeth on sprockets as wear will create chatter and accelerate chain wear.

Tensioner & Idler Pulleys - Wear in an idler creates vibration in the chain, allowing it to walk back and forth, and should be replaced.

Hex Shaft Bearings - Remove the drive chain and rotate the hex shaft with a wrench. If it doesn't feel smooth, replace any bearings not spinning smoothly.

Hex Shaft Alignment - Improper alignment can cause a section of the rows of your planter to lope, meaning that the population will go high and low as the alignment of those drive dogs changes through-out the field. Check the alignment at any of the fold points of the planter.

If you catch these errors before you go to the field, it's going to save you a tremendous amount of downtime in the coming season, or worse, poor stands that you don't know about until the crop emerges.



10

Meter Calibration



The meter is the heart of the planter. So if you think about every seed that gets placed in the furrow, it starts at the meter.

It's important that this meter is running at a high level of accuracy. To start, bring that meter to a Precision Planting Premier Dealer, where they will put it on a MeterMax® Ultra test stand and tell you if you have any worn components that need to be replaced as well as set your meter so it gives you the best level of accuracy once you go to the field.

We encourage you to bring your meter in so that when you go to the field, you know that your meters are giving you the best results possible. Every brand or type of meter can benefit from being fine-tuned, and Precision Planting dealers are experts at getting your meters ready for planting.

11

General Items



There's some general items on your planter that you're going to want to check before heading to the field.

Many items on your planter will need lubrication. This includes things like gauge wheel arms and the different pivots for folding the planter. You should check your operators manual to see all of the lubrication points that need to be addressed on your particular planter.

Another very important thing is checking that your tractor tires are inflated evenly across the tractor and at the correct pressure. Also, check that the tractor is ballasted properly for the load. Did you change anything from last year like adding liquid or fertilizer tanks to the planter or tractor? Those changes might affect your ballasting needs. Check the manufacturer's recommendations.

12

Bar Height



It's important to make sure you set your planter bar height so your parallel arms run level with the bar. When your parallel arms run uphill to the bar, you limit the amount of travel that you have for the row-unit. As you start to go over any sort of terrain it's possible that your row-unit bottoms out to that stop and you'll plant shallow.

On most planter brands you're looking for clearance of about 20 to 22 inches from your frame to the ground. On a Case 2000 series planter that should be roughly 26 inches from the ground to the frame.

Stand behind the planter and make sure that your planter bar is level. It's possible that the center can be a different height than the wings which can cause some issues as well as you travel through the field. If you have a 3-point mounted planter with a pneumatic gauge wheel out front, you may need to lift or lower that and make sure it's the same as the one on the other side.

13

Level The Planter



If your planter's a 3-point mounted planter you're going to want to adjust the lift arms to get the quick hitch leveled before hooking up the planter. If you have draft control on your tractor, you're going to want to turn that down or off before planting to make sure it's not trying to adjust that height and the levelness of the planter when you're going through the field.

You want to check that the toolbar of your planter is level. We're talking about the toolbar that the row-unit is attached to, not the tongue of the planter.

If the front of your toolbar is lower than the back of the toolbar, your row cleaners are going to be too aggressive and you're not going to achieve the seeding depth that you're expecting. Also, your seed firmer and closing system will not have as much pressure on them and they will not be able to do their jobs well.

It's important to get your toolbar leveled out before you head to the field and then double-check and level it out once you get to the field. If your toolbar isn't running level, then you need to make an adjustment to the height of the hitch to get your planter toolbar leveled out.



14

Evaluating Your Downforce Setting



The correct downforce setting can be used as a tool to achieve structural integrity of the furrow. The goal of a good seed furrow is to have a clean and open environment with equal moisture, temperature, and consistent soil density in order to achieve the uniform germination and emergence that leads to optimum yield potential.

Excess- While carrying too much weight can create a clean and open seed furrow, it also creates compaction in the side walls of the furrow. This will create issues for your closing system's ability to put soil back together, negatively impacting the seed environment. Root development later on in the plant's life will also be affected, causing the plant to have less yield because the roots are restricted because of the excess weight carried on the gauge wheels.. Gauge wheel tracks will be over-

pronounced on the surface with excess downforce.

Too Little - Without enough weight on the gauge wheels, the furrow environment created is too loose and compromises the integrity of the side walls, allowing them to cave in and deposit dry soil and clods around the seed. This creates an inconsistent environment for germination and emergence, and you won't achieve uniform moisture and temperature. Your plants will have multiple days difference in emergence timing due to the variable heat and moisture that each seed has. Gauge wheel tracks will likely be hard to find on the surface.

Correct - When the correct amount of downforce is applied, gauge wheel tracks should be visible, but not firm. As you dig alongside the furrow, you should see movement of the soil, and if you lift, the soil should crumble and fall apart. This means you can have confidence in your closing system's ability to close the seed furrow and achieve good density around the seed. With the correct downforce setting, emergence will be consistent and so will root development later in the season

The planting conditions you are in will determine your optimum downforce setting. If planting conditions get drier, it's going to be harder to hold the sidewall, so you will need a higher downforce setting. As you get into wetter conditions, you will need to choose a lower downforce setting as now compaction is a risk, and it will be easier to hold the sidewall in those wet conditions.

15

Furrow Monitoring



You can't adjust for what you can't see. Here are a few of the metrics that you'll want visible so that you can make proper adjustments.

Population, singulation, and spacing shows that the planter is dropping the correct number of seeds, one at a time and that they're being spaced correctly once they enter the trench.

Good ride helps you understand what might be affecting spacing. It also helps understand whether the correct seed placement is being achieved; if not, bounce of the row units could be affecting seed spacing.

Downforce helps you know whether or not there is enough weight being applied to the row-unit to keep your planter consistently at the depth chosen with your depth adjustment lever, as well

as to understand the amount of extra weight that is being applied to the soil.

Furrow moisture and soil temperature tell you about the environment that the seed is going into and whether or not it's the optimum environment for good emergence for your seed.

Being able to see each of these metrics on the 20|20® gives you the confidence to know that each acre you plant is going to end with the best possible emergence and best possible seed placement.



Don't let your
planter hold
you back.



A Premier Precision Planting Dealer is your partner to help you achieve a picket fence stand this spring and steer clear of the regret that comes from avoidable yield loss caused by lack of maintenance.

**Ask a Precision Planting Dealer About
Precision Planting Today**