US FARM SYSTEMS

9” - 12” Auger Press

MAINTENANCE AND REPAIR

US FARM SYSTEMS
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9” - 12” Auger Press

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9” - 12” Auger Press

12” x 8’ Incline Auger Press

DESCRIPTION

The US Farm Systems auger press is designed to remove excess moisture out of the waste material. This is done by forcing the material through spring loaded discharge doors (1). The body of the auger contains an inner perforated screen. This allows water to pass through and exit a drain (2). There are two sections of the screen, first, the open hopper section (3) and second, the cylindrical press section (4). The cylindrical press section is where most of the water is removed. The flights of the auger inside the cylinder stop short of the doors to allow the material to create a plug. This plug is pressurized by the force of the springs and water is forced out of the material until it has built up enough force to discharge. The auger press is simple in design, but does require a certain amount of attention and maintenance to ensure that you get the maximum performance and life out of your equipment. Neglect will only lead to small problems turning into larger problems that could have been prevented with a bit of preventative maintenance.

1. Spring Loaded Discharge Doors
2. Drain
3. Hopper
4. Cylindrical Press Section

9” - 12” Auger Press

9” x 4’ Auger Press
(mounted on end of conveyor)

12” x 8’ Incline Auger Press
(mounted between double 8x12 slope screens)

Auger Types

There are six common types of auger presses that are available depending on your application needs. Custom builds are also available upon the owners request.

Common Sizes Available:
9” x 4’ Auger Press
9” x 8’ Incline Press
9” x 10’ Horizontal Press
12” x 5’ Auger Press
12” x 8’ Incline Press
12” x 10’ Horizontal Press

The 4’ or 5’ versions will be attached to the end of your conveyor. The 8’ and 10’ versions will be mounted below your slope screen(s). All augers are similar in design and all require the same type and amount of preventative maintenance to ensure proper operation.

Break In Period

During the initial start-up and break in period after installation, it is a good idea to keep an eye on the auger to ensure it is running properly. The RPM of the auger is matched to keep up with the flow of material being fed into it. If the hopper is filling up, there is a problem. If the material is not discharging out of the auger or coming out excessively moist, there is a problem. In any case, call US Farm Systems to schedule a service check to properly adjust the auger.

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Scheduled Maintenance

At each end of the auger, you will need to grease the bearings with 4-5 shots once every two months (based on a run time of approximately 10 hours per day). Depending on which model you have,

Fig 1 Grease Zerk (incline auger)

the location of the zerk will vary. Versions mounted on the end of a conveyor will have both front and rear bearing zerks remotely located on the left flange of the conveyor adjacent the motor.

Motor end bearing zerks (Fig 2) on most models will be remotely attached to the outside of the motor shield. Newer versions require you to loosen the wing nuts, and remove the shield to gain access to the zerk. At this time you should also lubricate the chain coupler

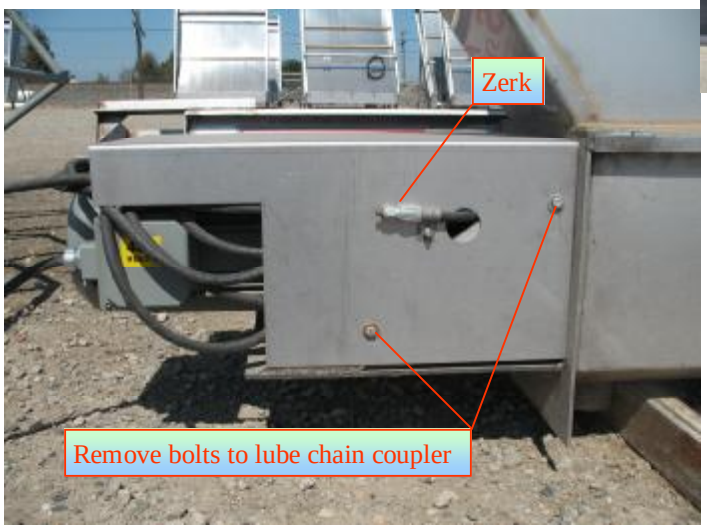

Fig 2 Grease Zerk (motor end)

Fig 3 Discharge Cover

The cover over the discharge section should be removed once a month to inspect and clean the press section of the screen (fig 3-5). On some occasions, as material is pressed through the screen, it might not drain thoroughly and start to fill up the inside of this chamber. This is fairly normal. Take a hose and clear everything out. Neglect in this area can cause the chamber to become completely plugged, and decrease the performance of your auger.

Fig 4 (cover removed)

Fig 5 (screen removed to reveal plugged chamber)

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General Maintenance

As your auger press ages, it’s a good idea to start checking for signs of wear and tear. Since it is a press, it is under a fair amount of stress that can lead to failed bearings, broken shafts, bent broken or cracked parts. You might operate a year with no such problems, maybe two.

Spray down and clean off the auger so that everything is visible and thoroughly look over all moving parts. Listen to and watch the auger operate as well. The sound of grinding metal should never be present. Look to see that the material is actually discharging through the end and has not become plugged. If excess moisture seems to be present after the discharge, the space in between the perforated screen and the outer shell could be plugged with fibers that have passed through the screen and are not allowing the water to drain. It’s important to properly maintain and clean this area (see scheduled maintenance).

The auger screw itself will go approximately 7300 hours (2 years based on 10 hours run time per day) before the flighting at the end of the press has worn down enough and is time to be replaced. This should be checked after a year or so and requires a little bit of extra work. To check and measure the auger, follow these steps:

1. Shut off the main breaker at the panel.
2. Remove each spring (does not require tools) and open discharge doors. (Fig 1)
3. Clear out remaining material and hose down interior of discharge area to get a clear view. (Fig 2)
4. Check the flights for signs of wear. (Fig 3)

The press section of the auger flight has been hard surfaced prior to installation to prolong its life. This area will still wear due to the high friction level. The original gap between the auger flight and the perforated cylinder was approximately 1/8”. The flights will eventually wear down in diameter and in thickness. The auger will still perform at a high level even after the flights are worn to a certain level. The end of the flights will receive the most wear. This is not where you want to take your measurement. The measurement should be taken 1 full rotation of flighting into the cylinder (fig 3). If this gap has grown to 1/4” to 3/8”, it is time to replace the screw. Screw replacements are available in individual components, full assemblies and discharge assemblies.

If let go for too long, the risk of failure and excess damage to the auger can occur. Torque load on the motor and shafts will rise due to an increased amount of force required to press the material. Burning a motor is rare. Snapping or spinning a shaft is more likely. Broken shafts can lead to all sorts of costly problems. It is better to catch it before that point is reached.

Fig 1

Fig 2

Fig 3

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Auger Screw Repair

If during maintenance and inspection you find that you need to repair or replace the auger screw, these are the steps that you will need to go through.

Removal:

1. Remove springs (and open doors)
2. Remove discharge cover
3. Thoroughly clean out press section
4. Remove discharge shaft set collar
5. Remove discharge bearing mount
6. Remove motor shield
7. Remove coupler chain (c-clip)
8. Loosen motor shaft sprocket
9. Loosen motor shaft set collar
10. Pull auger out

Note: The auger screw (depending on size) can be very heavy and will likely take more than one person, or a forklift to remove. Do not attempt to remove on your own. A 12” x 8’ long screw assy. weighs approximately 350 lbs.

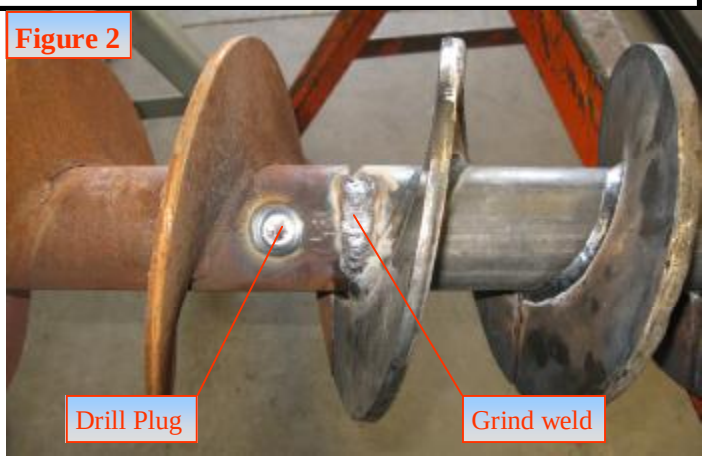
If the screw does not want to come out, the tunnel screen might be damaged, (**figure 1)** causing it to hang up on the flights. An inspection can be done by removing the discharge cover (although damage to underside of screen will not always be easily visible). If damaged, it can be removed and replaced. To remove:

Figure 1

1. Remove discharge doors
2. Pull (or pry) tunnel assembly out

Note: Depending on the wear on the auger, sometimes the whole auger needs to be replaced, and sometimes just the discharge section needs replacing. If the entire screw assy. needs replacing, US Farm Systems offers the entire screw unit with new shafts and everything assembled, or you can choose to purchase all parts individually and assemble it yourself.

Figure 2



Replacing Discharge Section:

1. Plasma cut where the flights are joined (can use a torch but will be difficult)
2. Grind weld along center that connects the tubing (careful not to damage the coupling shaft, the tubing is 1/2” thick) **figure 2**
3. Use sledge or slide hammer to break the screws apart

Note: At this point, you will have to determine whether or not you will have to replace the coupling shaft by measuring and test fitting your new discharge section. A loose fit is not acceptable, and a screw that is not straight will be extremely difficult to re-install. A screw that is not straight will rub the screen causing premature wear. If shaft is okay, skip to step #10

4. Center punch plug weld
5. Drill 1/4” starter hole about 5/8” deep
6. Drill 1” x 5/8” deep to remove plug weld (there are two)
7. Use slide hammer to remove shaft
8. Insert new shaft (may require pinging to achieve tight fit)
9. Re-weld plugs
10. Hone out new discharge auger shaft with flapper wheel
11. Grind bevel on auger tubing to achieve deep weld **Figure 3**

Figure 3

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12. Slide auger on and make sure flights match up
13. Weld tubing together (7018 rod recommended, or breakage may occur)
14. Weld flights together **figure 1**
15. Grind welds connecting flights together to achieve a smooth transition **figure 2**

Figure 1

Figure 2

Note: Depending on if you purchased your discharge screw as an assembly with the discharge shaft installed, or as separate components, you are now ready for installation, or need to install the shaft.

16. Hone out end of screw with flapper wheel
17. Insert new shaft (may require pinging to achieve to achieve tight fit) **figure 3**
18. Weld plugs solid

Figure 3

Re-Installation of Screw Assy.

Note: The auger screw (depending on size) can be very heavy and will likely take more than one person, or a forklift to re-install. Do not attempt to re-install on your own.

1. First of all, you’ll have to get the motor end of the screw a good 6”or so inside the auger. Then with one or two people (depending on weight) slide the screw all the way down through the body **figure 4**

Figure 4

Note: The screw will not always slide in easily. You could run into one or two problems (or both)

Problem one: At motor end, the shaft might not slide through the bearing.

Solution: Loosen the bolts holding the bearing on, slide the shaft through, then, re-attach the bearing.

Problem two: Auger flights get caught up inside the tunnel portion of the screen.

Solution: It’s not very easy, but you will have to try and locate where the rubbing is occurring, pull out the screw a bit, and grind down that portion of the flights. The screw is designed to have only a 1/16” tolerance between the flights and the screen. So if everything is not perfect, you will run into this problem.

2. Before you completely slide in the auger screw, slide on the motor shaft set collar and then the motor shaft sprocket
3. Install sprocket chain
4. Install discharge shaft bearing
5. Now is time to run the auger and check if everything is running correctly. You should hear no sound of grinding metal. If you do, that means the screw flights are rubbing on the screen. If not corrected. It could potentially wear a hole in the screen letting manure through and plugging the auger

Solution: The discharge bearing hangar has a little bit of up and down adjustment. You will sometimes have to grind off the two flat pieces on the hangar to gain full adjustment. Once you have it adjusted correctly, weld all this back together. If you cannot fix the problem with this adjustment, unfortunately you will have to pull the auger back out and do more grinding

2. Once you have the auger running perfectly, all you have left is to re-attach the remaining parts and you are done.