Discovator-Field Cultivator Maintenance

Proper servicing and maintenance is the key to the long life of all farm equipment. With careful and systematic inspection of your Discovator/Field Cultivator, you can avoid costly maintenance downtime and repair.

1.) Always use the transport lock when working or doing maintenance on the Discovator/Field Cultivator. If folded, be sure the wing stop pins are in place. Read and understand all safety decals on the equipment.

2.) During the first season of operation, and periodically after that, check the bolts for tightness. This is especially important on the spring loaded shank pivot bolts; these must remain tight to prevent excessive wear on the shank assembly.

3.) Check wheel bearings occasionally for proper adjustment. Repack seasonally.

4.) Replace or rotate worn parts as needed – bearings, sweeps, shanks, etc.… On Discovators, check scrapers and make sure gang turns freely.

5.) If machine is stored outdoors over the winter months it is a good idea to fold the machine then set it down on the ground so all the cylinders are retracted to protect the cylinder rods. This will extend the life of the cylinder seals and reduce internal and external leaks that cause future problems maintaining a level machine.

6.) Check drag bolts and parts for looseness or excessive wear. Replace broken or bent teeth. Your drag is an important part of the tillage operation.

7.) Check and tighten or replace any hydraulic leaks. Check hoses for any leaks. It is important that there are no leaks on the equipment that may change the depth when in field position.

8.) Grease disc gang bearings and wheel bearings sparingly. Over greasing may cause damage to seals and reduce the life of the bearing. Grease hinge points periodically:

   Disc Gang Bearings     Grease every 50 hours
   Wheel Bearings         Grease every 50 hours and check for endplay
   All Hinge Points       Grease every 10 hours
   Walk Beam Pivot Bearings Grease every 100 hours and check for endplay

9.) Inflate all tires as recommended in the operator’s manual.

By following and maintaining a routine service and lubrication program, your tillage equipment will give you many years of service.
ADJUSTMENTS BEFORE GOING TO THE FIELD

1.) Make sure your tractor horsepower matches the implement you are pulling. This is important so the implement can do the best possible job. (Field Cultivator: 5 to 6 HP/foot) (Discovator: 7 to 8 HP/foot)

2.) Hitch the tractor to the Discovator/Field Cultivator using the block or yoke clevis determined by the tractor drawbar. Use the correct size pin for clevis or block.

3.) Clean all hydraulic couplings and connect to tractor. Each hydraulic coupling has a colored handle on it and is marked with a cylinder, either extending (black) or retracting (red).

4.) If machine is folded, remove the transport pins from the wing stops. (Do not remove pins if the wing is leaning against the pins or putting pressure on the pins. Use the hydraulics to pull the wings in completely before unpinning them.) Once the pins are removed, slowly unfold the unit. Make sure no one is under the wings during the unfolding process. Check again for hydraulic leaks and watch that hoses do not get pinched in hinges, wings stops, etc….

5.) After the machine is completely unfolded, raise and lower the Discovator/Field Cultivator several times to purge air from the hydraulic system. Again check for hydraulic leaks and tighten or replace if necessary.

6.) Pre-leveling of machine can be done on a concrete slab or good level surface. Lower machine so sweeps are 2” to 3” off of ground on the center frame. Adjust the turnbuckle (4) at the front of machine to level it from front to back. (Shorten to bring front down, extend to bring front up.) Level machine with the front row shanks just slightly deeper than the back.

7.) Set the wings to match the depth of the center. This is done by adjusting the eyebolt on each wing. (Lengthen the bolt to run shallower, shorten the bolt to run deeper.) In some conditions the wings will need to be set slightly lower than the center, as the center may tend to run deeper behind the tractor tires.

8.) On the floating hitch field cultivators the front wheels are used to level the machine also. These are adjusted up and down with a turnbuckle on each wheel. (Shorten to lower front end, lengthen to raise front end.) Again, the front should be slightly lower than the rear.

9.) At this time you can also adjust the disc gangs on the Discovator. Adjust them to run ½” to 1” shallower than the cultivator sweeps. With the machine raised up, the starting measurement is 4” from top of blade to bottom of frame. At this point your depth gauge should read +½. All gang springs are to be set at 8½” from edge of casting to top of cupped washer.

10.) Check safety chain hookup. Make sure all warning lights are hooked up and functioning correctly.

11.) Check the tire pressure for proper inflation and check the tightness of the lug bolts. Tire pressure amounts are located on the sidewall of each tire.

12.) Check for any bolts that may need tightened or retightened. Grease the gang bearings on the Discovator. (These are sealed bearings and should not be over greased.) Grease all the hinge points. The hubs come pre-greased and will not need more grease at this time.

13.) Put transport lock in place and refold the machine slowly. Put wing stop pins in place. You are now ready to go to the field.
FIELD ADJUSTMENTS
& GENERAL OPERATING INSTRUCTIONS

1. The Discovator is designed as a secondary tillage tool and is designed to leave a finished seedbed following some form of fall or spring tillage. In some conditions it may be used as a primary, one-pass tillage tool. For best results, if at all possible, run the machine at a slight angle to the rows. This will improve trash flow and help spread the residue more evenly throughout the field.

2. The ideal working speed is 6 to 7 mph. Working too slow may cause plugging, poor incorporation or mixing of crop residue and reduced weed kill. Running too fast may cause streaks in chemical incorporation and ridging.

3. Check disc gang depth. DO NOT run the disc gangs deeper than the sweeps. Running the gangs too deep can cause plugging, poor incorporation, excessive wear on the gang assemblies and may tend to hold the front of the machine out of the ground. This would make the back of the machine run deeper than the front causing poor incorporation, and generally doing a poorer job of preparing a seedbed. Set depth gauge at ½” to 1” deep by using your hydraulic cylinder or ratchet jack.

4. If possible, have someone observe the machine during first time operation for levelness – front to rear and wings to center frame. Adjust each as needed. For front to rear, either extend or shorten the length of the turnbuckle on the self-leveling hitch. To change wing to center frame, use eyebolt on each wing. On 5-section Discovators with hydraulic gauge wheels, set the wheels in field position to be 1” to 2” off the ground.

5. When you have the machine set to the desired working depth, set the depth stop slide on the depth control cylinder. This is located at the front of the machine on the hitch. This will maintain a constant depth each time after raising and lowering the machine.

6. If after setting the depth stop, the detent on the tractor kicks out before the stop contacts the button on the depth stop, slow the hydraulic flow speed down. If this problem still persists, contact the factory service representative for other possible adjustments. DO NOT try to adjust the rebound valve without first contacting the factory service representative.

7. Adjust the drag to leave the desired results while maintaining the trash flow through the drag.

   a.) On the spike drag, start with 5 links hanging from the chain in drag arm bottom slot. (This is the starting point for worst conditions.) The cleaner the ground, the shorter the pull chain may be pulled up. On the spike drag, one of the links in the first row of angles is turned over. This allows the trash to start flowing through the drag easier by changing the angle of the first row of teeth. Always make sure that the drag is never pulling off the hang chains. If so, shorten pull chains.
7. Drag Adjustment -- continued

b.) On coil tine drags, start with the top eyebolt (1) centered. Then level drag mainframe (2) by changing position of leveling bolts (3). There are two holes in the arm and four in the mainframe. One of these will get you where you need to be to level. To lay the teeth back, remove the clip pin (4) on each end and move strap adjustment by pushing the handle (5) forward. This strap has 5 holes and will let you lay the teeth back several degrees. If it is desired to set one row, usually the first, different than the rest as far as the angle is concerned, it can be adjusted individually by loosening the U-bolt and set screw on each end of the drag bar. Down pressure on the drag is achieved by lengthening the eyebolt (1) on the top bracket. Depending on the amount of down pressure, you may need to re-level the mainframe.

c.) On the hd spike drag, start with 5 links hanging from the chain (1) in the drag arm bottom slot. (This is a starting point for worst conditions). The cleaner the ground, the shorter the pull chain may be pulled up. Always make sure the drag is never pulling off of the hang chains (2). If so, shorten the pull chains. Adjust nut (3) to where spring (4) is just making contact with front plate (5). Turn nut (3) another 1” further on spring rod (6) to set preload on spring (4). Lengthen turnbuckle (7) to adjust front mini shank (8) to run more aggressive and shorten to run more passive. Be sure the fold catch assembly (9) is aligned 3-7/8” from back of rear angle iron of fold catch to rear of arm as shown.

d.) On a reel (1), adjust the amount of down pressure by either shortening the eyebolt (2) for less pressure or lengthening the eyebolt for more pressure.

*Make sure reels are installed with twisted bars oriented forward as shown. Mounting backward can damage reels in rocky conditions.*