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## Gravity Table

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## GRAVITY TABLE

### COMMON INSTALLATION MISTAKES

1. GRAVITY INSTALLED ON A WEAK FOUNDATION.
2. BLOWERS RUNNING BACKWARDS.
3. PROTECTOR OVER AIR-FILTER NOT REMOVED.
4. AIR NOT CLEAN.
5. MACHINE RUNNING WITH LOOSE CLAMPS.
6. USING WRONG DECK.
7. TRYING TO OBTAIN CAPACITY BEFORE GETTING EFFICIENCY.
8. ATTEMPTING TO SEPARATE COMMODITIES NOT SUITABLE FOR GRAVITY SEPARATION.
9. USING INSUFFICIENT AIR.
10. USING EXCESS AIR.
11. BELTS SLIPPING

A short discussion of each of the above faults follows.

## TRY THESE SIMPLE STEPS TO START A NEW GRAVITY

1. While the machine is not in operation make the following adjustments by means of the jack screws at the high end of the machine. Loosen the clamps, make the adjustments, tighten the clamps.

DECK ADJUSTMENT.	Machine No.	50.	80.	130.
Difference in SHORT-SIDE elevation		1½"	1 ¾"	2"
Difference in LONG-SIDE elevation		2½"	4"	5"

2. After being sure the BLOWERS ARE NOT TURNING BACKWARDS, close tight all the air-gates.
3. Open the feeder to flow a small amount of seed approximately 4"-6" wide. Without air, the seed will flow directly across the deck surface and "bank" against the cut-out gates along the upper side of the deck.
4. Adjust the eccentric speed to force the seed up-hill in a smooth travel. Too much speed will cause the seed to "jump" up-hill.
5. Gradually open the air-gates (two) on the Blower nearest the feeder. It will be noticed the seed will begin to slightly "boil" and the lighter elements will begin to separate and flow backwards.
7. Continue making feed, and air adjustments, until the lighter elements are caused to flow along the "banking rail" along the lower edge of the long side of the deck. The deck surface should now be fully covered with an even bed of seed.
8. Beginning at the lower cut-out gate, gradually open these gates to allow the escape of clean seed over the upper long side of the deck. As the clean seed escape through the cut-out gates, open the feeder to replace the same amount as the escaping seed.
9. Should the lighter elements commence to travel away from the banking rail, adjust by closing cut-out gates, or by increasing air, or by decreasing speed, or by increasing feed.

### 1. GRAVITY INSTALLED ON A WEAK FOUNDATION.

A weak foundation is the cause of many Gravity failures. A slight vibration at the base of the machine is multiplied many times on the deck. The Gravity is a reciprocating machine, and like all reciprocating machines, the Gravity must be secured to a solid foundation.

Weak foundations cause false vibrations which react adversely to the flow of the seed across the deck. False vibrations counter-act the mechanical force of the eccentrics. Often the seed bed will surge, or flow in waves across the deck, when false vibrations become synchronized with the eccentric force. In other words, when the seed bed starts flowing in waves at regular intervals look for false vibrations. A good solid foundation pays big dividends.

### 2. BLOWERS RUNNING BACKWARDS.

Blowers running backwards is one of the common mistakes in new installations. The function of the Blowers is to build a static pressure in the air-chest to insure an even air flow through the deck cover. The degree of this static pressure depends on the size of the seeds being cleaned, and the openings in the deck cover.

Notice the directional arrow on the feed end of the Gravity. The direction of rotation may be checked by removing the cover of the variable speed change pulley which is found near the directional arrow. The speed change pulley runs in the same direction as the Blowers.

Another method to determine correct Blower rotation is to remove the deck and start the machine. The fan wheels should be turning toward the fan opening. By opening one of the air gates the Blower will deliver a strong air blast.

If a three phase motor is being used, simply change any two connections and the motor will run in the reverse direction.

### 3. PROTECTOR OVER AIR FILTER NOT REMOVED.

The Gravity is shipped with a protection over the air-filter. This is done to protect the filter during shipment and installation. The protector should be carefully removed so as to not damage the filter screen underneath.

#### 4. CLEAN AIR.

The importance of clean air cannot be stressed too strongly as the success of the Gravity depends on a source of clean air. Dust laden air will soon close the meshes, or openings, in the inoperative, or "blinded". Blinded decks can easily be noticed by the seed bed appearing to be dead.

All Oliver Gravity Separators provide two means of introducing clean air into the machine. The built-in air filter is for use in locations having a limited amount of floating dust and chaff. If this filter requires cleaning too frequently, the air must then be taken from a more remote location.

The machine is provided with a short nipple and a canvas flexible connection. If the built-in filter is being used, the canvas connection is kept closed, or tied. However, should it become necessary to pipe the air from a distant location, there should be a gap of about 3" left between the stationary intake pipe and the nipple on the machine. This gap allows adjustments to be made without disturbing the intake pipe.

Never attempt to clean an air filter while the Gravity is in operation. There is a strong suction against the filter screen and any attempt to brush, or remove the accumulation of dust particles adhering to the filter surface merely forces the smaller particles through the filter and quickly blinds the deck cover.

Often in shipping a Gravity the frames enclosing the Blower compartment become loose. The edges should be inspected for air leaks and any openings found should be closed with putty, or by inserting small pieces of felt in the opening.

Even under favorable operating conditions it is necessary to frequently clean Gravity Decks. Some operators purchase an extra Deck which can be quickly installed. The extra Deck insures continued operation with very little delay in cleaning Decks.

#### 5. LOOSE CLAMPS.

The operator will find two tie-rods running along each side of the air-chest. The purpose of these rods is to rigidly clamp two plates which fix the air-chest to the base of the Gravity. The clamps should be loosened before attempting to adjust either the side-raise, or the end-raise, and should be quickly tightened again. Loose clamps induce false vibrations.

## 6. USING WRONG DECKS

The general rule for deck covers is; the smaller the seed, the smaller the opening in the deck cover. Conversely, the larger the seed, the larger the opening in the deck cover.

The above rule simply means that alfalfa, clover, and similar seeds cannot be efficiently cleaned on decks having large openings designed for cleaning beans, peanuts, peas, and like stocks. Use the right deck for a given size seed.

## 7. TRYING TO OBTAIN CAPACITY BEFORE GETTING EFFICIENCY

New operators often have a tendency to try for high capacities before taking the time to adjust their machine properly for efficiency. Efficiency should come first and increased capacity to function properly the matter of increasing its capacity becomes a simple matter.

## 8. ATTEMPTING TO SEPARATE COMMODITIES NOT SUITABLE FOR GRAVITY SEPARATION

The Gravity is a "specialized" machine designed to separate two, or more, commodities of the same size but differing in specific gravities. Unless the commodity comes under this general rule, the Gravity becomes an inefficient machine.

## 9. INSUFFICIENT AIR

The deck surface of the Gravity Separator is divided into two zones, a STRATIFYING ZONE, and a "SEPARATING ZONE".

The stratifying zone lies on the deck area near the feed. Here the air ject stratify the seed according to their relative weights. The light weight seed are forced to the surface of the seed bed while the heavier layer of seeds seek a location on the deck surface.

The separating zone is the remaining area of the deck surface after the seeds become stratified. The eccentric motion causes the heavier layers of seed to move uphill. The lighter layers of seed not having contact with the deck surface are caused to flow down-hill.

INSUFFICIENT AIR causes all seeds to flow uphill similar to a deck surface badly blinded with dust particles.

## 10. EXCESS AIR

The common fault to be found with new operators is their tendency to use excess air. Excess air serves to lift the heavier seeds off the deck surface and to "blow" the heavier seeds to flow down-hill and report with the tailings. It is impossible to stratify the seed into relative weight zones and without stratification there can be no separation. The new operator who takes the time to adjust the air will find his time well spent.

## 11. BELTS SLIPPING

Belt slippage is frequently another source of trouble, especially when starting the Gravity on a cold morning. "V" belts should not be rigidly tight which will cause excessive wear on bearings. Slipping belts cause an irregular flow of the seed across the deck.

And while we are on the subject of cold mornings, at the start of the winter season it is good practice to tighten the bearing races on the shaft. Cold weather causes the grease in the bearings to thicken and the shafts to become slightly smaller. Shaft scoring is caused by the bearings sticking and the shaft revolving in the inner race of the bearing. A good inspection of the set screws fixing the bearing to the shaft might eliminate the trouble of replacing a scored shaft later.

### NEW OPERATORS

New operators often experience some difficulty in starting a Gravity. They have likely seen Gravities in operation with a full bed of seeds on the deck. They seem to get the impression that they can immediately duplicate the work by simply turning on the power and opening the feeder. Such is not the case as a Gravity Separator must be adjusted according to each variety of seeds being cleaned.

### MAKE ALL ADJUSTMENTS GRADUALLY

All Gravities have the following adjustments:

1. Feed.
2. Eccentric Speed.
3. Air Control.
4. Lateral Inclination of the Deck.
5. Longitudinal Inclination of the Deck.

The reason for making all adjustments gradually is because the Gravity does not respond quickly to any adjustment. A short time must be allowed before the effect of an adjustment can be noticed. After making the adjustment wait a few minutes to see what effect the adjustment made on the flow of the seeds across the deck. Then continue with another adjustment until a satisfactory product is obtained.

Never make two, or more, adjustments at the same time, otherwise, the operator will not know which adjustment benefitted the separation.

Remember to first adjust for efficiency. Once the Gravity is adjusted to give the desired separations, the matter is increased capacity will follow.

Like every machine found in the Seed Cleaning Plant, the Gravity depends on the skill of the operator.