Gravity Separator Operating Instructions Manual

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SAFETY PRECAUTIONS FOR GRAVITY SEPARATORS

Read operator's manual before using machine.

Always shut off the lock out power when performing maintenance or service.

Never operate machine with air filters removed.

Never operate with deck removed.

Never operate with missing or worn parts.

Never operate with air chest boot removed.

Never operate with worn or damaged decks.

Never use deck as table or workstation.

Never stand on machine.

Always wear face and eye protection when inspecting or adjusting machine.

Wear ear protection when operating machine.

Always insure machine and components are electrically grounded.

Keep machine clean and properly adjusted.

Inspect for wear and correct operation frequently.

If you have questions call the factory.

Make Safety First

And

Make It Last

GRAVITY SEPARATOR OPERATING INSTRUCTIONS

I. INTRODUCTION

CONGRATULATIONS! You have just purchased a well-built machine that can earn substantial profits for you, if you take time right now to understand the Oliver Gravity Separator and how it works. The operating instructions manual contains new, valuable information that both experienced and inexperienced gravity operators will want to read. Please take a few minutes to read the instructions to help eliminate many of the problems frequently encountered.

Keep in mind at all times that the Oliver Gravity Separator is not a "cure all" for the processor's problems. The gravity separator is a specialized piece of machinery designed to separate particles of a similar size that differ in weight, eliminating light trash. Oliver Gravity Separators should not be used as a cleaning machine to remove dust, dirt, sticks and other refuse frequently found in harvested crops. The gravity separator should not be used as a sizing machine. Screening machines can do this job more efficiently. In all processing situations, the best results are obtained on the gravity when the product has been thoroughly pre-cleaned and sized, using the proper equipment for those purposes. Under these conditions, the gravity separator is able to show what it can really do!

II. INSTALLING YOUR OLIVER GRAVITY SEPARATOR

All Oliver Gravities are operated on test blocks at the factory for a minimum of two hours. During and after operation, the drive train and controls are checked to insure that they will operate satisfactorily when you set them up and punch the switch.

UNCRATING YOUR OLIVER

Although your Oliver is built to give years of service, it can be damaged while uncrating. First the top of the crate should be carefully removed, then the sides. After the top and sides are removed, the Oliver Gravity can be removed from the bottom of the crate by removing the four 3/8" bolts located in the mounting flanges of the Gravity Separator. While removing the crate, do not lay anything on the separating deck. A good separation is not possible, if the deck is damaged. Also, be careful not to puncture the filter screens located on the sides of the machine. If the filter screens are damaged, dirt may be sucked into the machine and plug the deck.

Immediately after uncrating your Oliver Gravity, inspect for carrier damage. If damage is evident, it was caused in transit and a claim should be filed with the carrier.

The feed hopper, mounting brackets, discharge hoppers and drive sheaves are attached either to the inside of the crate or inside the Gravity Separator. All items securely fastened inside the gravity may be removed by opening the filter screens and cutting the tie wires.

FOUNDATION REQUIREMENTS

A solid level foundation is required for your Oliver Gravity. False vibrations from flooring can ruin the separation quality of the machine. A six inch concrete slab is ideal but not essential. Many customers operate Oliver Gravities on wooden floors with no problems. If your floor is insecure, please contact the factory for recommendations.
When locating your Gravity, be sure that you leave adequate clearance to operate the controls and to remove the deck for changing or cleaning. To operate the controls and provide normal maintenance, a minimum of 30 inches clearance is recommended. The deck may be removed from any side. Normally, a space approximately equal to the dimensions of the deck is adequate for deck removal. Please refer to the specification sheet at the end of these instructions for dimensional Information.

ELECTRICAL CONNECTION

After your Gravity is mounted on a secure foundation, you are ready to install the motor and make the necessary electrical connections. If you ordered your Gravity with a motor, it will be installed at the factory and you will only be required to make the necessary electrical connections. If a motor is installed at the factory, it will be wired for 60 cycle, 220 volt, 3 phase power unless otherwise specified. If your power supply is different from this and you order a motor, please inform the factory well in advance of the shipping date so the motor can be correctly wired. If you supply your own motor, be sure that it is large enough to carry the load as specified in our current literature.

The motor is mounted directly to the motor mounting board, located in the base of the machine below the feeder on a left hand machine (the corner opposite on a right hand machine). With the motor outside the machine, install the motor shaft sheave to the motor, using the bushing provided. Then loosen the motor mounting board and slide it towards the fan drums. Place the motor on the board, mount the belts and align the motor so that the blower sheave and the fan sheave are parallel. Once the motor is properly aligned, mark the motor mounting base where the motor mounting bolts should go. Remove the motor. Then remove the motor mounting board. Drill the motor mounting board. Then mount the motor on it using bolts recommended by the motor manufacturer. Finally, reinstall the motor and belts inside the base of the machine.

After the motor is installed, the belts should be adjusted to the proper tension. When belts are too tight, excessive strain is placed on the bearings, which will shorten their life. When belts are too loose, they will slip. Slippage will cause the belts and sheaves to overheat and shorten their life. To check for proper belt tension, first turn off the machine. Then apply pressure to the side of the belt midway between the sheaves. The belts should deflect approximately 1/2 inch. After the machine has been run 8 to 10 hours, check the belts again. It is normal for new belts to stretch, so belt tension will probably have to be adjusted.

When your electrician wires the motor, be sure that he connects it so that it will run in the proper direction. All shafts (motor shaft, fan shaft and eccentric shaft) should turn clockwise when viewed from the end of the machine where the motor is installed. This will be true whether the machine is a right hand or a left hand model. Proper fan direction is very important and at least half of the problems with new Gravities can be traced back to incorrect rotation.

CLEAN AIR SOURCE

Some customers need to bring in clean outside air rather than drawing dusty plant air through the filters installed on the side of the machine. For this purpose. we supply an air nipple which can be used to bring air into the machine. It can be installed by merely removing a filter screen and replacing the screen with an air nipple. The air nipple may be installed in any of the filter openings, but best results will be obtained using openings located near the feed end of the machine. Connect your duct work to the air nipple and run it to your clean air source. Do not use duct work of smaller diameter than the air nipple that came with your machine. We recommend that the duct work be kept shorter than 20 feet; otherwise, use a booster fan. The clean air source should have a filter area not less than the area of the deck surface. The filters should not restrict the air flow. We recommend that the pressure drop across the filter be less than 0.25 inches W.C. at a flow velocity of 500 ft/min through the filter.

After your Gravity Separator is installed and the motor is wired so the fans rotate in the proper directions, become familiarized with the following operating instructions and the theory behind gravity separation.

III. HOW DOES A GRAVITY SEPARATOR WORK?

To effect a separation on any gravity separator, the same principles apply. Once they are understood, it is usually a simple step to adjust a gravity separator to produce optimum separation. The term "Gravity Separator" is a contraction of the proper name "Specific Gravity Separator," which means, a separator of particles differing in their specific gravities.

About 250 B.C., Archimedes discovered the law of specific gravity which is: "ALL BODIES FLOATING IN OR SUBMERGED IN A LIQUID ARE BUOYED UP BY A FORCE EXACTLY EQUAL TO THE WEIGHT OF THE LIQUID THEY DISPLACE." The specific gravity of a particle is the ratio of its density to some standard substance, the standard usually employed being water with a specific gravity of one (1). Particles having a specific gravity of less than 1 will float, and particles with a specific gravity greater than 1 will sink.

All gravity separators use air as a standard rather than water. Since air is lighter than water, the relative difference between particles of differing weights is increased. For this reason, the gravity separator is a very sensitive machine and, when operated correctly, can produce a very precise separation.

THE PROCESS OF STRATIFICATION

Air is used as the separating standard through the process of stratification. Stratification occurs by forcing air through the particle mixture so that the particles rise or fall by their relative weight to the air. Figure 1 below represents a cross section of the Gravity Separator directly over a fan. A particle mixture has been introduced on top of the screen deck with the fans off.

In Figure 2, the fan has been turned on and adjusted, so that the heaviest particles rest on the surface of the deck and the lightest particles are completely free of the surface of the deck. Proper regulation of the air-flow at this time is critical; or the result is a situation seen in Figure 3, where all particles are lifted free of the separating surface by excess air.

FIGURE 1

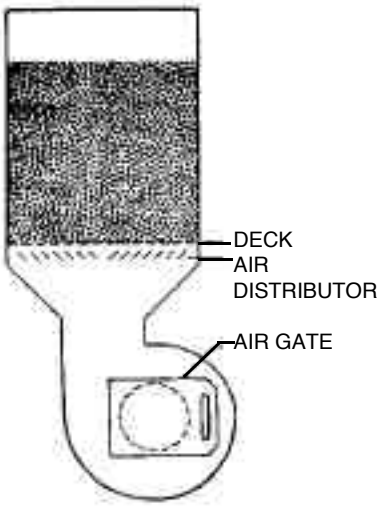


FIGURE 2

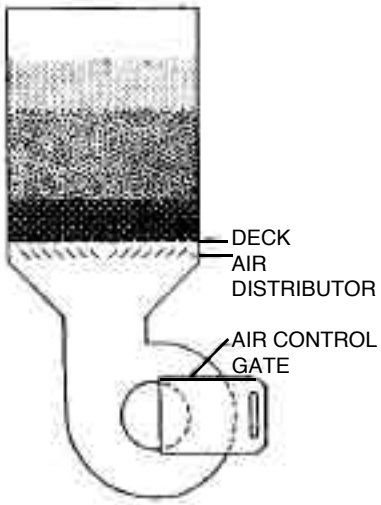
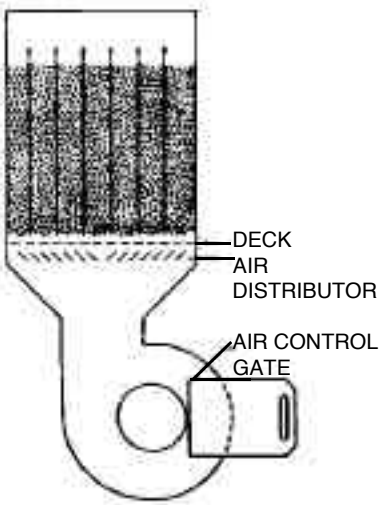
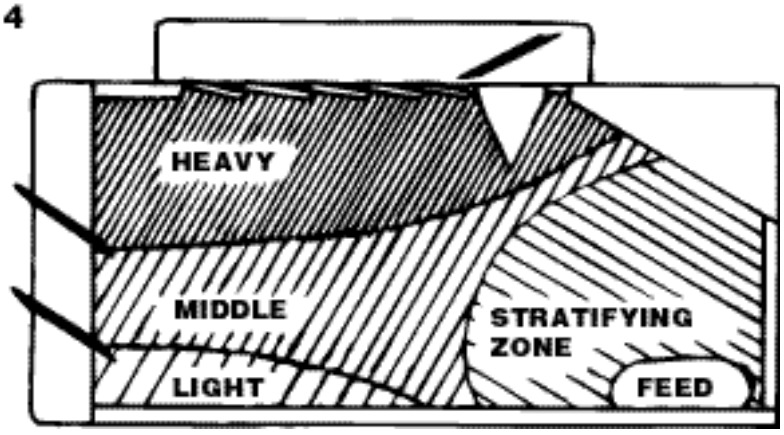


FIGURE 3



The Theory In Practice. Figure 4 represents a top view of the ideal situation in the operation of a gravity table.

FIGURE 4



The particle mixture, similar to Figure 1, falls from the feeder onto the deck. The area immediately around the feeder is called the STRATIFYING AREA. In this area the vibration of the deck and the lifting action of the air combine to stratify the material into layers, with heavier layers on the bottom and lighter layers on the top as shown by Figure 2. Separation cannot occur until the material becomes stratified. The size of the stratification area will depend on the difficulty of separation and on the capacity at which the machine is processing. At no time should the stratification area exceed one-third of the deck surface.

The more difficult the separation, the greater is the area that is required to obtain proper stratification. For example: The stratification area is large when separating frosted beans from saleable beans, because there is relatively little difference in weight. However, the stratification area is small when removing insect damaged peas from whole peas because there is a large difference in weight. Higher capacities, likewise, require higher areas for stratification.

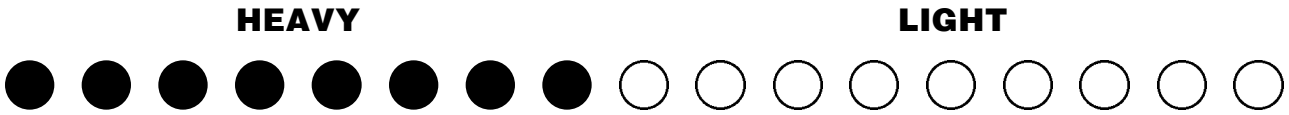
Once the material becomes stratified, the vibrating action of the deck begins pushing the heavier layers in contact with the deck toward its high side. At the same time, the lighter layers, which are at the top of the bed and do not touch the vibrating deck, float downhill toward the low side of the deck. As the material flows downhill from the feed end to the discharge end of the deck, the vibrating action gradually converts the layers of vertical stratification to a horizontal separation. By the time the material reaches the discharge end of the deck, the separation is complete. Heavier materials should be concentrated at the high side of the deck. Light materials should be at the low side of the deck, and intermediate materials will be in between.

It should be noted that the drawing (Figure 4) represents an ideal situation. While ideal situations are nice in theory, they rarely occur in actual practice. Usually the stratification area will not be clearly defined and must be assumed to occupy an area of from 2 to 6 square feet around the feeder. Also, the separation process will begin immediately after the material becomes even partially stratified. Therefore, it is important to stratify the material as quickly as possible; or light material may be carried to the high side of the deck before the stratification process occurs. The best way to accomplish this is to use more air at the feed end than at the discharge end.

In many separations, the distinction between heavy good particles and lighter poor particles is not visible to the unaided eye. In this case, periodic testing for weight per test volume at various points along the discharge would be necessary to determine if the correct separation is being made.

The discharge from the Gravity Separator is a continuously graded product ranging from the heaviest particle to the lightest particle. In practice, however, this continuous grade is broken down into three products, (1) a heavy or acceptable product, (2) a light or reject product, (3) a small middling product that has not fully separated. In processing where rocks or other heavy trash might be present, a fourth product can be extracted, consisting of rocks and some good product for further processing.

OLIVER STEELE'S GUIDELINES FOR USE OF GRAVITY SEPARATORS
WHAT GRAVITY SEPARATORS CAN AND CANNOT DO



Rule 1. PARTICLES OF THE SAME SIZE BUT DIFFERING SLIGHTLY IN SPECIFIC GRAVITIES CAN BE SEPARATED.

A common example of this would be the separation of similar size seeds, the lighter of which has been hollowed out by the insect damage or lack of development.

RULE 2. PARTICLES OF THE SAME SPECIFIC GRAVITIES BUT DIFFERING IN THE SIZE WILL BE GRADED ACCORDING TO THE SIZE OF THE PARTICLES.

A common example of this would be the elimination of shriveled corn kernels from whole kernels of the same density.

RULE 3. PARTICLES DIFFERING IN SPECIFIC GRAVITIES AND ALSO DIFFERING IN SIZE CANNOT BE EFFICIENTLY SEPARATED ON A GRAVITY.

An example of varying sizes and the densities occurs on every ear of corn. Depending on their location on the ear, corn comes in a variety of sizes; small rounds, medium rounds, small flat, medium flats and large flats. Because of growing conditions seed weight varies within a given size range, Often, separation of unsized corn gives less than satisfactory results.

IV. CONTROLS OF THE OLIVER GRAVITY

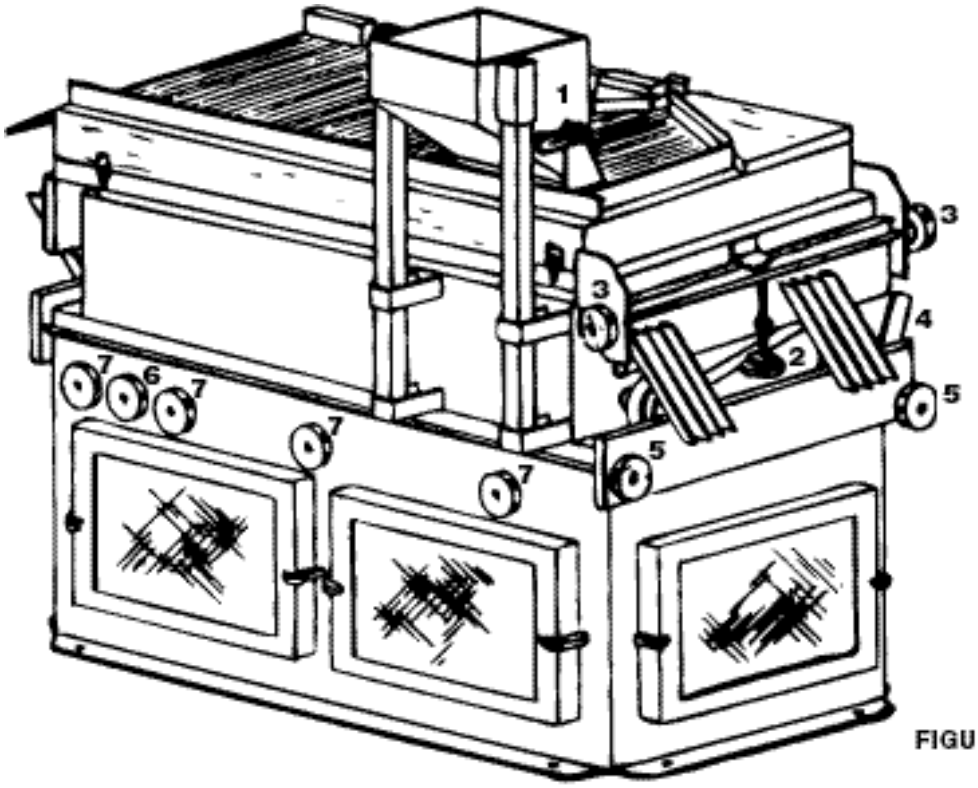
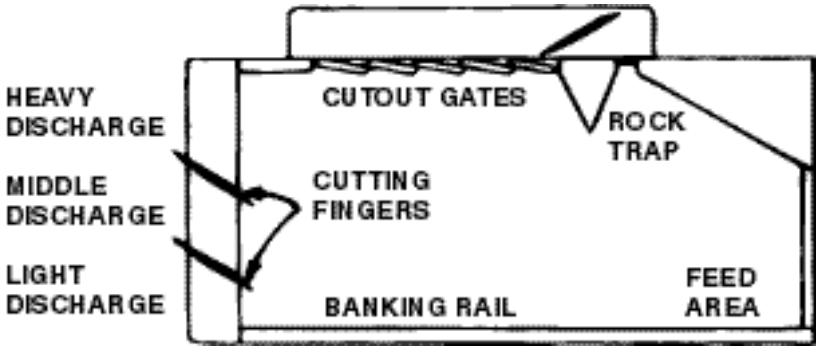


FIGURE 5

LEFT HAND MODEL

1. Feed Rate Control
2. End Raise Control
3. Clamping Knob, End Raise
4. Side Tilt Adjustment Handle
5. Side Tilt Clamping Knob
6. “More Speed” Control Knob
7. “More Air” control Knob



Before starting to operate the machine, it is necessary to have a thorough understanding of the controls and their location on the Oliver Gravity Separator. PROPER REGULATION OF THE CONTROLS IS THE KEY TO SUCCESSFUL GRAVITY SEPARATION. PROPER USE OF THESE CONTROLS SHOULD BE UNDERSTOOD PRIOR TO ATTEMPTING AN ACTUAL SEPARATION.

THE DECK

The most important part of any gravity separator is the deck, because it is the main separating surface. The deck consists of a carefully constructed wooden frame; an undercover, which develops the air pattern; and a screen or cloth overcover, which is the surface on which the separation takes place.

On the open end of the deck are mounted two cutting fingers, which are adjustable to channel different fractions of the finished product according to their value. On the side of the deck opposite the feeder are located the cut-out gates, which are used to increase capacity as described in these instructions. On the same side of the deck and closer to the feed end is the rock trap, which is used to bleed a heavy trash product from the machine to avoid contamination of good heavy product. These features will be discussed further in the instructions, but knowledge of their locations is important, as is understanding the controls that affect the five variable adjustments in the gravity separator.

THE FIVE ADJUSTMENTS

All gravity separators have five variable adjustments that must be properly adjusted and balanced to obtain optimum separations. These are: feed rate, end raise, side tilt, eccentric speed, and air control. We will discuss the controls for each of these variables in turn. (Please refer to Figure 5.)

FEED RATE

The feed rate control is located on the feeder and governs the amount fed onto the separating deck. Whether standard Oliver feeders are used or another type is employed, a means of controlling the feed is essential. The feed rate (fast or slow) should be uniform and free of surges. Surges in the incoming feed will show up in the discharge of the machine as a poor quality separation. The use of surge bins above the feeder is strongly suggested.

Generally, the average feed rate is determined by the average capacity of the processing line of equipment. For optimum separation on your Gravity Separator, the feed rate should be as low as possible without falling below the minimum feed rate at which the deck can be kept completely covered. Maximum feed rate is the maximum rate at which the deck can be fed and still obtain the necessary separation. When starting your Gravity Separator, always start at the minimum feed rate. Obtain the required separation, and then increase the feed rate to the desired capacity.

END RAISE

End raise is the slope from the feed end of the deck to the discharge end. This slope determines the rate of flow from the feed end to the discharge end of the deck. Greater end raise means a greater rate of flow and less exposure time for the seed. Less end raise means a slower rate of flow and more exposure time for the seed. Quality of separation can be related to exposure time for the seed. In general, the longer a seed mass is exposed to a separating action, the cleaner it becomes.

End raise and feed rate are closely related controls. As feed rates are increased, end.raise must be increased so that the depth of material on the deck will not become too great. As feed rates are decreased, the end raise should be lowered, so that the depth of material will not become too thin and the deck will remain completely covered. The end raise control (2) is located at the feed end of an Oliver Gravity Separator. To change the end raise, loosen the clamps (3) and screw the adjusting crank up or down as required. Then re-tighten the clamps.

SIDE TILT

Side tilt is the difference in elevation between the high side of the deck and the low side of the deck. Increasing side tilt will cause the material to shift toward the low side of the deck. Decreasing side tilt will cause the material to shift toward the high side of the deck. Normally, the best separations are obtained when side tilt is set at or near the maximum steepness. However, care should be taken not to set side tilt too steep. Side tilt is too steep when material cannot be made to flow toward the high side of the deck by increasing the eccentric speed. Too little side tilt occurs when all the material moves toward the heavy side of the deck despite low eccentric speed. The side tilt is adjusted by loosening the two clamping knobs (5) and moving the side tilt adjustment handle (4) in towards the machine for more tilt and away from the machine for less tilt.

ECCENTRIC SPEED

Eccentric speed and side tilt are closely related. Increasing eccentric speed will cause material to be shifted toward the high side of the deck. Decreasing eccentric speed will cause material to be shifted toward the low side of the deck. Generally, by increasing eccentric speed (which shifts the material toward the high side) and increasing side tilt (which shifts light materials back toward the low side) a more precise separation can be obtained. Too much eccentric speed can be observed when all the material shifts to the high side of the deck despite maximum side tilt being used. Eccentric speed is adjusted by turning the "More Speed" control knob (6) located on the side of the machine. Turning the knob clockwise increases the speed and turning the knob counterclockwise decreases the speed.

AIR CONTROL

Air regulation is one of the most important adjustments to be made on a Gravity Separator. The most common mistake in air control is the use of too much air. Separation is not made by "blowing" the light material from the heavy, but by using a controlled air flow to create the stratified layers that are then separated by the vibrating action of the deck. Too much air will cause a boiling or bubbling action lifting the heavier particles from the deck and mixing them with the lighter top layers. Too little air will cause the material to appear sluggish and to pile up at the high side of the deck.
With proper air regulation, the bed of material will be almost fluid in appearance. The material on the surface should be agitated and free flowing, with the exception of the stratifying zone under the feeder. Bubbling should be kept to a minimum, allowing the vibrating deck to make the separation. It was discovered through experience that the air pattern under the deck must be varied when working with different commodities and sometimes even with different lots of the same product. To enable these corrections to be made quickly and accurately in the field, Oliver Manufacturing Company has developed and patented a system of multiple fans to supply the air for separation. Each fan is individually adjustable to enable the processor to adjust the air pattern and air column as necessary to make an optimum separation. With older single fan systems and even with the newer vacuum systems, the air patterns are preset at the factory and very little range of adjustment is available to the processor.

On Oliver's multiple fan machines, air is regulated by turning the "More Air" control knobs (7) clockwise for additional air and counterclockwise for less air. There are roughly 110 revolutions of the knob between a closed air gate and a fully opened air gate.
All the controls on the Gravity Separator serve a purpose and must be balanced with the other controls to obtain optimum separation. With this understanding, you are now ready to begin making an actual separation.

V. START UP AND OPERATION

INITIAL STARTING PROCEDURES

An experienced Oliver operator should have little trouble starting the gravity and obtaining good results. However, often for the novice the confusion that results when the machine is first turned on defies description! Many of the initial adjustments must be made soon after material is fed onto the deck. Therefore, it is a good idea to operate the machine empty for a few minutes prior to attempting to make a separation. During this period one should listen to the machine to become familiar with the way it sounds during operation. Also, observe the oscillating action of the deck. Change the speed control to make the deck oscillate faster and slower.

Locate the tilt control handle. Loosen the clamps and operate the tilt control to increase and decrease the side tilt of the deck. Remember that side tilt and eccentric speed must be balanced against each other to create a smooth, uniform bed of material across the deck.

Check the feeding mechanism to insure that the feed rate can be controlled. Locate the end raise screw on the feed end of the deck. Loosen the clamps and raise and lower the feed end of the deck. Feed rate and end raise must be balanced against one another to insure a uniform flow rate of material from the feed end of the deck to the discharge.

Finally, open and close the air gates. Although this does not produce a visible effect on an empty deck, changes in air volume may be noted by holding your hand over the deck as the air gate controls are operated. The air control settings are the most important part of successful gravity operation. Before turning off the machine, make one final check to be sure that the fan shaft is turning in the right direction. When viewed from the feed end of the machine, all shafts should rotate clockwise for left hand gravities and counterclockwise for right hand gravities.

Table 1A. Preset Adjustments
Hi-Cap Master or Machine Equipped with Air Chest Divider

Model	Deck Cover	Ecc. Speed	Side Tilt	End Raise	#1	#2	#3	#4	#5	#6	#7
240	10 Mesh	3/4	Max	1/2	Max	Max	1/2	1/4	1/4	1/2	3/4
Ind.	Readout	450	3.5	2.5	5.5	5.5	3.5	2.0	2.0	3.5	4.5
240	16 Mesh	3/4	Max	1/2	3/4	3/4	1/2	1/4	1/4	1/4	1/4
Ind.	Readout	450	3.5	2.5	4.5	4.5	3.5	2.0	2.0	2.0	3.5
240	30 Mesh	3/4	3/4	1/4	1/2	1/4	1/4	Min	Min	Min	1/4
Ind.	Readout	450	3.5	2.5	3.0	2.0	2.0	1.5	1.5	1.5	2.0
240	Linen	3/4	3/4	1/4	1/2	1/4	1/4	Min	Min	Min	1/4
Ind.	Readout	400	3.5	1.5	3.0	2.0	2.0	1.5	1.5	1.5	2.0
160	10 Mesh	3/4	Max	1/2	Max	3/4	1/4	1/4	3/4		
Ind.	Readout	450	3.5	2.5	5.5	4.5	2.0	2.0	4.5		
160	16 Mesh	3/4	Max	1/2	3/4	1/2	1/4	1/4	1/2		
Ind.	Readout	450	3.5	2.5	4.5	3.5	2.0	2.0	3.5		
160	30 Mesh	3/4	3/4	1/4	1/2	1/4	Min	Min	1/4		
Ind.	Readout	450	3.5	2.5	3.0	2.0	1.5	1.5	2.0		
160	Linen	3/4	3/4	1/4	1/4	1/4	Min	Min	1/4		
Ind.	Readout	400	3.5	2.5	2.0	2.0	1.5	1.5	2.0		
80	10 Mesh	3/4	Max	1/2	Max	1/2	1/4	1/2			
Ind.	Readout	450	3.5	2.5	5.5	2.5	2.0	3.5			
80	16 Mesh	3/4	Max	1/2	3/4	1/4	1/4	1/2			
Ind.	Readout	450	3.5	2.5	4.5	2.0	2.0	3.5			
80	30 Mesh	3/4	3/4	1/4	1/2	Min	Min	1/4			
Ind.	Readout	450	3.5	2.5	3.0	1.5	1.5	2.0			
80	Linen	3/4	3/4	1/4	1/4	Min	Min	1/4			
Ind.	Readout	400	3.5	2.5	2.0	1.5	1.5	2.0			
50	10 Mesh	3/4	Max	1/2	3/4	1/4	1/2				
Ind.	Readout	450	3.5	2.5	4.0	2.0	3.5				
50	16 Mesh	3/4	Max	1/2	1/2	1/4	1/4				
Ind.	Readout	450	3.5	2.5	3.5	2.0	2.0				
50	30 Mesh	3/4	3/4	1/4	1/4	Min	Min				
Ind.	Readout	450	3.5	2.5	2.5	1.5	1.5				
50	Linen	3/4	3/4	1/4	1/4	Min	Min				
Ind.	Readout	400	3.5	2.5	2.0	1.5	1.5				

Table 1C. Preset Adjustments
316 Master or Machine Equipped with Air Chest Dividers

Model	Deck Cover	Ecc. Speed	Side Tilt	End Raise	#1	#2	#3
316	10 Mesh	3/4	Max	1/2	3/4	1/2	1/2
Ind.	Readout	450	3.5	2.5	4.5	3.5	2.0
316	16 Mesh	3/4	Max	1/2	1/2	1/4	1/4
Ind.	Readout	450	3.5	2.5	3.5	2.0	2.0
316	30 Mesh	3/4	3/4	1/4	1/4	1/4	Min
Ind.	Readout	450	3.5	2.5	2.0	2.0	1.5
316	Linen	3/4	3/4	1/4	1/4	Min	1/4
Ind.	Readout	400	3.5	1.5	2.0	1.5	2.0

Table 1B. Preset Adjustments

Hi-Cap Standard Not Equipped With Air Chest Dividers

Model	Deck Cover	Ecc. Speed	Side Tilt	End Raise	#1	#2	#3	#4	#5	#6	#7
240	10 Mesh	3/4	Max	1/2	Max	Max	Max	3/4	1/2	1/4	Min
Ind.	Readout	450	3.5	2.5	5.5	5.5	5.5	4.5	3.5	2.0	1.5
240	16 Mesh	3/4	Max	1/2	Max	Max	3/4	1/2	1/4	Min	Min
Ind.	Readout	450	3.5	2.5	5.5	5.5	4.5	3.5	2.0	1.5	1.5
240	30 Mesh	3/4	3/4	1/4	3/4	3/4	1/2	1/2	1/4	1/4	Min
Ind.	Readout	450	3.5	2.5	4.5	4.5	3.5	3.5	2.0	2.0	1.5
240	Linen	3/4	3/4	1/4	1/2	1/2	1/2	1/4	1/4	1/4	Min
Ind.	Readout	400	3.5	1.5	3.5	3.5	3.5	2.0	2.0	2.0	1.5
160	10 Mesh	3/4	Max	1/2	Max	Max	3/4	1/2	1/4		
Ind.	Readout	450	3.5	2.5	5.5	5.5	4.5	3.5	2.0		
160	16 Mesh	3/4	Max	1/2	Max	3/4	1/2	1/4	Min		
Ind.	Readout	450	3.5	2.5	5.5	4.5	3.5	2.0	1.5		
160	30 Mesh	3/4	3/4	1/4	3/4	3/4	1/2	1/4	Min		
Ind.	Readout	450	3.5	2.5	4.5	4.5	3.5	2.0	1.5		
160	Linen	3/4	3/4	1/4	1/2	1/2	1/4	1/4	Min		
Ind.	Readout	400	3.5	2.5	3.5	3.5	2.0	2.0	1.5		
80	10 Mesh	3/4	Max	1/2	Max	3/4	1/2	1/4			
Ind.	Readout	450	3.5	2.5	5.5	4.5	3.5	2.0			
80	16 Mesh	3/4	Max	1/2	3/4	1/2	1/4	Min			
Ind.	Readout	450	3.5	2.5	4.5	3.5	2.0	1.5			
80	30 Mesh	3/4	3/4	1/4	1/2	1/2	1/4	1/4			
Ind.	Readout	450	3.5	2.5	3.0	3.0	2.0	2.0			
80	Linen	3/4	3/4	1/4	1/2	1/4	1/4	Min			
Ind.	Readout	400	3.5	2.5	2.0	2.0	2.0	1.5			
50	10 Mesh	3/4	Max	1/2	Max	1/2	Min				
Ind.	Readout	450	3.5	2.5	5.5	3.5	1.5				
50	16 Mesh	3/4	Max	1/2	3/4	1/4	Min				
Ind.	Readout	450	3.5	2.5	4.5	2.0	1.5				
50	30 Mesh	3/4	3/4	1/4	1/2	1/4	Min				
Ind.	Readout	450	3.5	2.5	3.5	2.0	1.5				
50	Linen	3/4	3/4	1/4	1/4	1/4	Min				
Ind.	Readout	400	3.5	2.5	2.0	2.0	1.5				

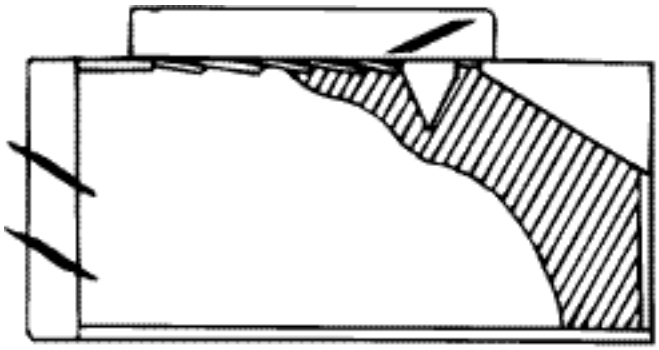
Table 1C. Preset Adjustments

316 Standard Not Equipped With Air Chest Divider Package

Model	Deck Cover	Ecc. Speed	Side Tilt	End Raise	#1	#2	#3
316	10 Mesh	3/4	Max	1/2	Max	1/2	Min
Ind.	Readout	450	3.5	2.5	5.5	3.5	1.5
316	16 Mesh	3/4	Max	1/2	3/4	1/4	Min
Ind.	Readout	450	3.5	2.5	4.5	2.0	1.5
316	30 Mesh	3/4	3/4	1/4	1/2	1/4	Min
Ind.	Readout	450	3.5	2.5	3.5	2.0	1.5
316	Linen	3/4	3/4	1/4	1/4	1/4	Min
Ind.	Readout	400	3.5	1.5	2.0	2.0	1.5

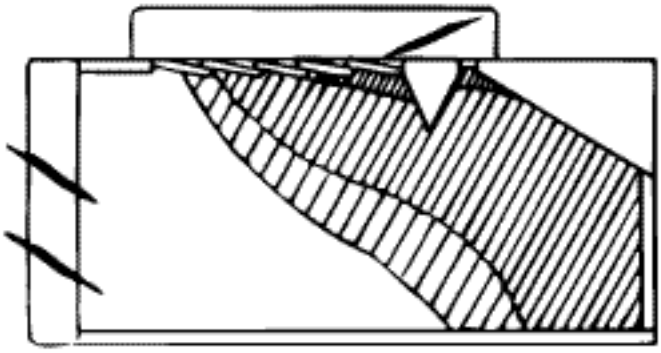
STEP 1

Preset all adjustments as suggested in Table 1. Be sure to fasten the clamps securely after making the end raise and side tilt adjustments. Turn on the machine. Open the feed gate slightly. Then adjust the eccentric speed, so that the material begins to move uphill.



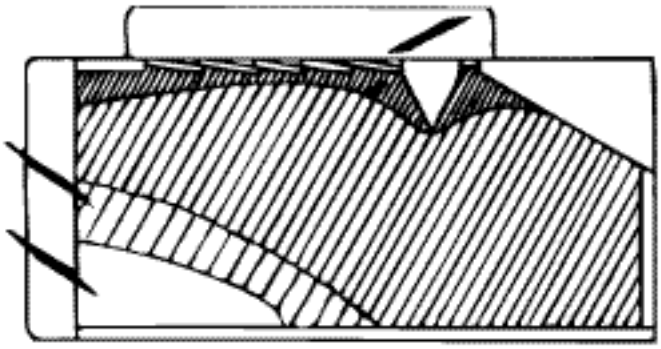
STEP 2

Wait until 1/2 of the deck is covered. Adjust each air gate to provide just enough air to keep the material in a fluid state. Best results will be obtained by adjusting each air gate in succession, beginning at the feed end. Always wait to see the effect of an adjustment before making another.



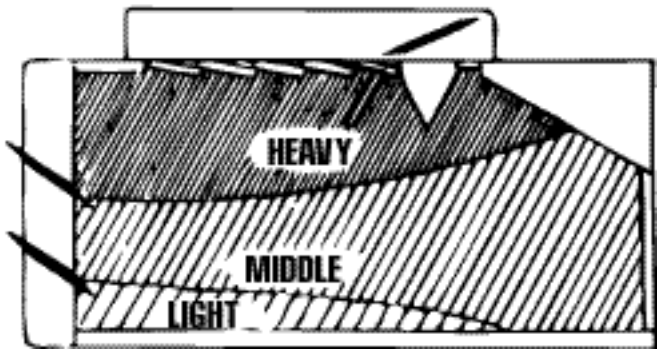
STEP 3

If a light zone fails to appear, slightly increase the air, side tilt or end raise. After the deck is covered completely, wait a few minutes. Then readjust the controls to obtain the best possible separation quality.



STEP 4

After the desired separation quality has been obtained, begin increasing capacity. First increase capacity by increasing the feed rate and end raise adjustments. Capacity can be increased further by opening the cut-out gates along the high side of the deck. Readjustment of the air-flow will probably be necessary at the same time in order to maintain separation quality.



1. SET UP

After becoming familiar with the operating characteristics of the machine, separation can begin. Preset the adjustments listed in Table 1 for your particular model. If your machine is not listed, use the adjustments for the machine that most resembles your own; or call the factory. Close all cut-out gates on the high side of the deck. These are used to increase capacity and will be discussed later.

2. STARTING YOUR OLIVER

When these initial adjustments are completed, turn on the machine. Open the feeder slightly and allow a thin stream of material to flow onto the deck. After there is a small amount of material on the deck, adjust the eccentric speed so that material begins to flow toward the high side of the deck.

3. ADJUSTING THE AIR PATTERN

Wait until one-half of the deck is covered. Adjust each air gate so that the material has just enough air to remain in a fluid state. Be careful not to open the air gates too much. If too much air is entering via the air gates, the material will appear to be "boiling" rather than flowing smoothly down the deck. Areas where there appears to be too little air might be noted. This is because the deck is not completely covered, allowing excess air to escape through the uncovered portion. When the deck becomes covered, the air pattern will shift to normal.

Once the deck is completely covered, begin decreasing the air flow beginning with the last fan (the fan closest to the discharge end of the machine) working toward the feeder. In succession, cut down on the air of each fan to the lowest point where separation can still be noted. If an air gate is closed completely, leave it closed and advance to the next fan closer to the feeder.

4. ADJUSTING SIDE TILT AND ECCENTRIC SPEED

After a good air pattern has been obtained, move to the discharge end of the machine; and observe the depth of material across the discharge end of the deck. The surface of the material should be smooth and uniform. The depth of the high side of the deck should be 2 to 3 times as deep as on the low side. If the bed is too deep on the high side, first increase the side tilt. Then decrease the eccentric speed or slightly increase the air. All of these actions will cause the material to shift towards the low side of the deck. If the bed is too deep on the low side of the deck, first increase the eccentric speed. Then decrease the air or, side tilt. These adjustments will cause material to shift towards the high side of the deck. After making these corrections, observe the resulting separation; and adjust the air pattern, if necessary.

5. ADJUSTING THE END RAISE

Check the end raise of the machine. If it is correctly adjusted, the depth of material at the feed end should be 2 to 4 times greater than that at the discharge end. If the bed of material is too deep, the end raise will have to be increased to cause the material to flow away from the feed end faster. If the bed of material is too thin, decrease the end raise to retain material at the feed end longer. To adjust the end raise, loosen the end raise clamp knobs (3) at the feed end. Then raise or lower the deck using the jackscrews. Finally, re-tighten the clamping knobs securely. It is important to have the clamps tight because they support the deck carriage while the machine is in operation.

INCREASING CAPACITY

Once the separation quality required has been obtained, begin increasing capacity.
1. First increase the side tilt. This will cause the material to shift toward the low side of the deck. To correct this, increase the eccentric speed until the proper pattern is obtained again. Continue increasing side tilt and eccentric speed alternately until the side tilt is at the maximum amount where you can still maintain the correct bed depth by adjusting the eccentric speed.

2. Next, open the feed gate slightly. This increases the feed rate so the bed depth will increase. Observe the change in the material on the deck. Then increase the end raise (See part 5, previous section.) to compensate for the increased feed rate. Continue increasing the feed rate and end raise until the maximum feed rate has been reached, where the machine can still maintain the required separation. The air may have to be increased slightly to compensate for the thicker bed of material. Be sure that the clamping plates are tight after each time the end raise is increased.

3. It is possible to increase capacity even more by opening the wooden gates along the high side of the deck. Begin by opening the wooden gate closest to the discharge end of the machine. After a couple of minutes, open a second gate.

After two or three of the side gates have been opened, the feed gate can be opened enough to compensate for the material that is being removed from the deck. As the bed of material at the discharge end becomes thinner, readjust the air, if necessary.

The number of gates that may be opened should be determined by the difficulty of separation and the end results required. The easier the separation, the more gates can be opened and the higher capacity can be obtained. Always remember that capacity and quality off-set one another. Therefore, if the separation quality does not meet standards, lower the capacity of the machine. Conversely, if the end product is better than it needs to be, increase your operating capacity.

SEPARATION RESULTS

Many customers ask us how we can determine when we are getting the most from a gravity separator. This is an extremely difficult question to answer because not all people want to accomplish the same thing by operating their gravity. We manufacture gravity separators to make a separation based on seed density. To do this, it is first necessary that the seed must be cleaned and properly sized. Since size, shape and weight of the seed directly effect the separation, it is imperative that the seeds be classified according to size and shape before attempting to make a separation on the basis of weight.

The most positive method of testing to determine the effectiveness of a gravity is through the use of a U.S. Standard Weight Per Bushel Tester. By using the Tester, determine the difference in weight between the heavy and light product. The gravity should be set to obtain the maximum weight difference between the light and heavy products.

The test weight per bushel of the heavy, middle and light fractions should be recorded along with the machine settings necessary to obtain this. Also, germination and vigor testing should be done on these fractions and the results recorded with the test weights. This gives a written record of the operation of the gravity separator and the settings necessary to obtain a separation of that product. These can be used as a reference when processing similar products in the future. The following is a sample form for recording the necessary information.

FORM FOR SETTINGS

PRODUCT _____ ID NUMBER _____

TEST WEIGHT #/BU _____ GERMINATION _____

% MOISTURE _____ SIZE RANGE: MAX _____ MIN _____

MACHINE SETTINGS:

1. End Raise _____ 2. Side Tilt _____

3. Eccentric Speed _____ 4. Capacity _____

5. Air Volume #1_____ #2 _____#3 _____#4 _____#5 _____#6 _____#7 _____

Processing Results:

	Test Weight	% Yield	Germination
(1) Heavy	_____	_____	_____
(2) Middle	_____	_____	_____
(3) Light	_____	_____	_____

Date _____ Tested By _____

VI. IN CASE OF DIFFICULTY - TROUBLESHOOTING

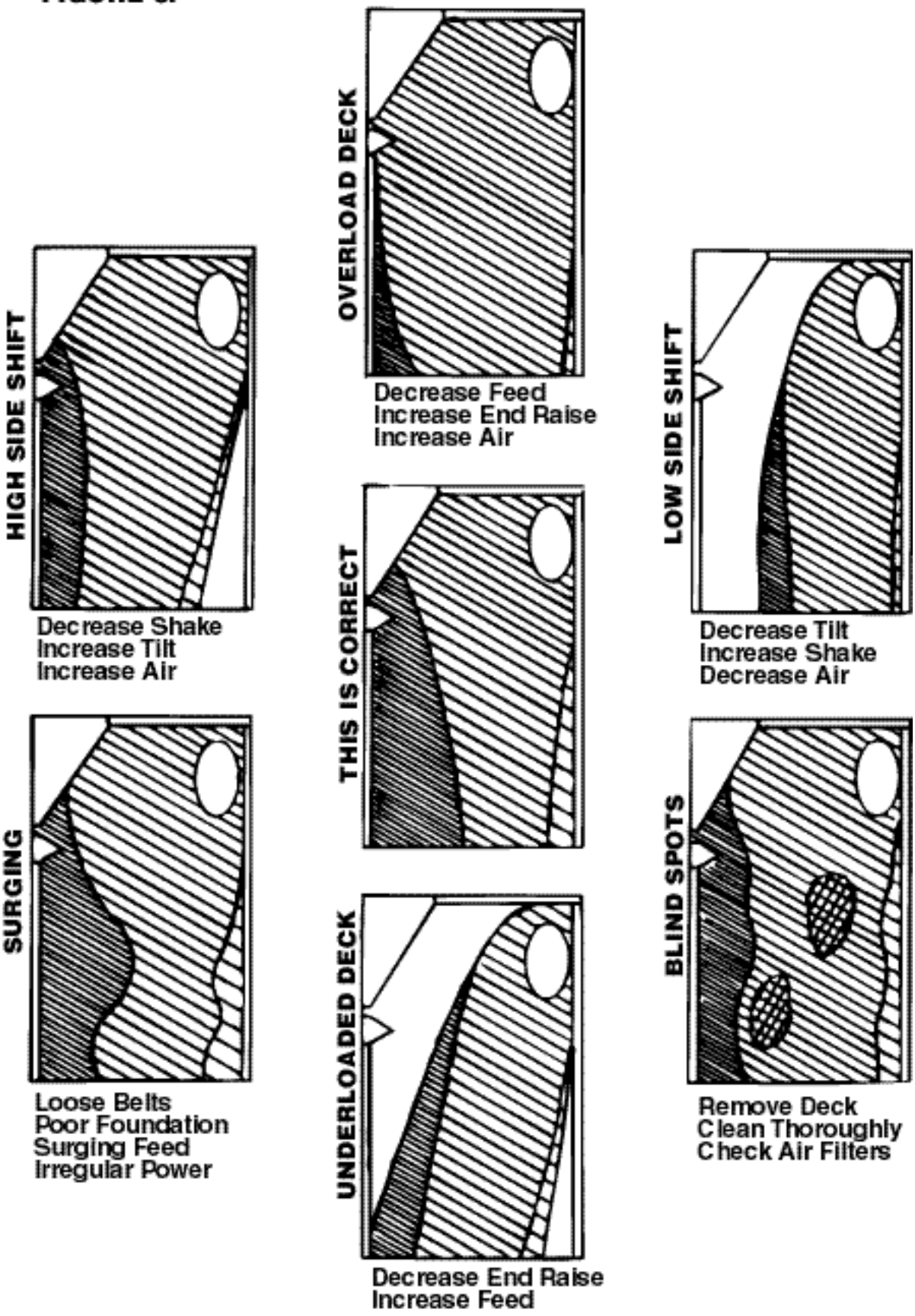
Most operators of gravity separators can get acceptable separations after working with the machine for a few minutes. However, in some cases, even experienced operators run into problems that they cannot solve. If your gravity is not giving satisfactory results, or even if it is, but you would like to see better results, read the following paragraphs.

Many operators expect results too soon from their gravity separators. When an adjustment is made, wait at least two minutes before deciding whether it has made any improvement. The reason for this is that because of the volume of material on the deck, a certain amount of time is required for the entire deck surface to adjust to the new conditions.

Do not attempt to operate the machine without an understanding of why it works. The more a person understands any situation the better he is able to cope with it. Your gravity separator makes a separation based on a particle's weight and its resistance to air flow. Proper adjustment of all the controls is necessary to obtain the best separation. Remember that your Oliver Gravity has five adjustments - feed rate, end raise, side tilt, eccentric speed and air control.

COMMON OPERATING PROBLEMS

FIGURE 6.



Note: The above sketches are for left hand machines. Right hand machines will show similar patterns but the heavy and light material will be on opposite sides.

FEED RATE

Feed rate determines the capacity of the machine. Minimum feed rate is the lowest rate of feed at which an adequate cover can be maintained over the entire deck. Maximum feed rate is the highest rate of feed at which an acceptable separation can be obtained. Between these limits, quality of separation generally goes down as capacity is increased, and up as capacity is decreased.

END RAISE

End raise determines the rate at which material flows from the feed end of the deck toward the discharge end. High feed rates require high end raise, and lower feed rates require lower end raise. End raise also determines the length of time a seed is exposed to the separating action. Therefore, end raise has a direct effect on quality of separation. Generally, increasing end raise decreases the quality of separation; and decreasing end raise increases the quality of separation.

SIDE TILT

Side tilt is the difference in elevation between the high side of the deck and the low side of the deck. Normally, side tilt should be set at the maximum, where an acceptable pattern across the deck can still be maintained. Too much side tilt is present when material cannot be made to climb to the high side of the deck. Too little side tilt is present when the material will not float to the low side of the deck.

ECCENTRIC SPEED

Eccentric speed is the rate of oscillation of the table. Eccentric action provides agitation so that materlal can be stratified, and the reciprocating motion that separates the heavier lower layers from the lighter upper layers of material. Eccentric motion and side tilt must be combined to get the best separating action. Too much eccentric speed will cause material to flow to the high side of the deck and spill over the banking rail. Too little eccentric speed will not cause the material to be agitated sufficiently to be properly stratified. Usually, with too little eccentric speed, material will lay on the table without moving and the table will quickly become overloaded.

AIR

Air is used as the stratifying agent. Unless material is properly stratified initially, a good separation cannot be obtained. Too much air will cause a bubbling boiling action that remixes the material as fast as it is stratified. Too little air will not stratify the material properly. Generally, lots of air is required in the feed area to obtain a good stratification. As material moves from the feed end to the discharge end, progressively less air is required to maintain proper stratification.

10 MOST FREQUENT PROBLEMS

From conversation with processors over a period of years, we have compiled a list of the ten problems most generally encountered when setting up a new machine. We list problems below, along with some suggested solutions.

1. Fans Running Backwards - At least half of the problems with new machines can be traced to backwards rotation of the fans. If It seems insufficient air is the problem, check fan rotation. When viewed from the motor end of any Oliver Gravity Separator, the fans and air shafts should run clockwise.

2. Blinded Decks - If there is insufficient air and the fans are running correctly, remove the deck and clean it. The deck can be cleaned best by blowing the dirt and chaff out from the top downward, while the gravity separator is running.

3. Dirty Air Filters - The air filters on the side of the machine are designed to screen dirt out of the air before it enters the machine. If they become plugged, the fans cannot pull enough air through them to provide proper separation. The air filters can be cleaned by removing them from the machine and gently tapping them on the floor. A more effective cleaning may be obtained by removing the filters and using compressed air to blow out the dirt.

4. Inadequate Foundations - Although Oliver Gravities are counterbalanced, they must be attached to a secure foundatlon. A six inch concrete slab is best, but is not absolutely essential. Many processors run Oliver Gravities on wooden floors with no problems. If any vibration can be felt in the floor while the machine is running, the foundation is probably too weak. Weak foundations lower the quality of separation because the foundation absorbs some of the oscillating action intended for separation.

5. Operating At Too Much Capacity - Often merely lowering the operating capacity slightly will greatly improve the separation. Capacity is usually dependent on the standards to be met and the quality of material being fed onto the gravity. Quality and capacity are inversely related. That is, increasing capacity usually lowers quality; and decreasing capacity usually improves quality.

6. Loose Clamps - Loose clamps are not a common problem, but they occur more often than people realize. Loose clamps usually occur when an operator makes an adjustment and fails to tighten the clamps sufficiently. The result of loose clamps is false vibrations. False vibrations absorb much of the oscillatory action of the deck and produce results similar to weak foundations.

7. Using The Wrong Deck Cover - Deck covers are the portion of the machine that actually make the separation. Without friction between the deck cover and the material to be separated, no separation will result. Therefore, a cover must be selected that will perform well with a specific product. Using the wrong cover will cause poor quality separation in very low capacity and sometimes will cause sufficient damage to the deck that it must be rebuilt. Generally, the cover should have a rough surface texture and the openings should be as large as possible without allowing material to fall through. Oliver makes four standard decks: cloth for small grasses; 30 mesh wire for seeds the size of alfalfa and clovers; 16 mesh wire for seeds the size of wheat and oats; and a 10 mesh wire for large seed such as beans. A variety of special decks to meet particular needs are also available.

8. Belts Slipping - Belts commonly slip on new machinery. New belts have a tendency to stretch slightly and should be checked frequently during the first couple of weeks of operation. To check a belt, turn off the machine. Then apply pressure to the back of the belt midway between the two pulleys. The belt should deflect approximately 1/2 inch.

9. Attempting to Separate Commodities Unsuitable For Separation - This is a very rare problem because normally a gravity separator will make some improvement in any seed lot. However, a gravity is a specialized machine designed to separate particles of varying density and similar sizes. If material does not fall into that classification, then it probably cannot be separated on a gravity.

10. Wrong Adjustment - This is most commonly a problem with new, inexperienced operators. The solution is usually more experience. Do not be afraid to adjust the machine. Make an adjustment. Wait a couple of minutes to determine the effect. Then decide if it is good or bad. If the effect is good, then try something else for further improvement. If the effect is bad, return to the original setting. Allow a couple of minutes and try another adjustment. Finally, remember to make all adjustments in small increments. It is better to approach the final setting through several small steps than to make one adjustment that might be too large.

The final pattern on the deck may vary depending on the product being processed. However, for most commodities, the overall pattern will be similar. We suggest an average depth of material of from 1-2 inches for seed or other products the size of beans, from 1/2 to 1 inch for commodities the size of wheat seed, from 1/4 to 1/2 inch for materials the size of alfalfa seed and less than 1/4 inch for anything smaller than alfalfa seed. As a general rule, the product depth along the high side of the machine should be from 1 to 3 times the depth along the low side of the machine. The average depth of material at the feed end of the machine should be from 2 to 4 times the average depth at the discharge end. These patterns will not be correct for all commodities. However, approximation of these conditions on the deck surface will cause separation. From this point, make the necessary adjustments to obtain optimum separation.

As an additional aid in setting your gravity, a chart is provided that shows many situations that can occur and lists adjustments that will help correct the pattern. (See Figure 6.)

Finally, if you cannot get the separation you want, please call the factory (719-254-7814). Our staff will be glad to give you the approximate settings to separate your product on your machine. If you have specific problems or questions, let us know. We will be glad to share our thoughts on the subject with you. For the convenience of our customers, we maintain a laboratory service where we can process your sample. There is no charge and all samples will be returned upon your request. If you have a sample you would like to have tested, just call us. Then we can discuss your problem and determine how much of a sample is needed for testing. If you like, we can set the test dates so you can be present during the test. We respectfully ask that you pay all freight costs.

VII. MAINTENANCE

Your Oliver Gravity Separator is designed to give years of trouble-free service. However, as with all machinery, periodic maintenance is required to keep it in top condition. The following is a list of some areas that can be problems, if not periodically checked.

DECKS

The deck of your Oliver is that portion of the machine that actually contacts the material and makes a separation. To maintain optimum separation, the deck should be checked frequently and cleaned or repaired as needed. Even in very clean atmospheres, dust and dirt will build up on the underside of the deck. This causes a restriction of air flow through the deck and will eventually plug the deck completely. Decks should be blown down frequently with the machine running. Using compressed air, blow straight down on the deck surface with the machine operating. Dust that is lodged on the underside of the deck will be loosened by the reverse air blast then blown upward through the deck surface by the air produced by the fans.

When the deck becomes plugged, it is necessary to remove the deck from the machine and clean it. The best method of cleaning the deck is to use compressed air blowing from the top downward. Thoroughly clean the entire deck. A deck that is only partially cleaned will become plugged sooner. To check if a deck is clean, place a light on a drop cord under it. If the deck is clean, you should be able to see light through every opening of the deck cover. Dirty areas will show up as dark spots and should be cleaned more thoroughly.

Because decks are in direct contact with the material being separated, they are subjected to abrasive wear. Inspect your decks frequently for wear. As a deck wears out, the surface becomes smoother and it becomes more and more difficult to move the heavier seeds out from under the lighter layers. Normally, when the wires of the deck overcover are worn halfway through, it is time to repair the deck. If the deck cover is worn completely through, there is danger of ruining the undercover which develops the air pattern. All Oliver decks with wire overcovers are built with a perforated metal undercover, which develops the air pattern, and a woven wire overcover, which actually make the separation. As long as the undercover is not damaged, it is not necessary to replace it.

When rebuilding a deck, always inspect the deck thoroughly. Look at the underside of the deck and inspect each rib for cracks. If the ribs are cracked, it will be necessary to tear down the deck completely to replace it. If the ribs are alright, inspect the undercover. As long as the undercover is not damaged, it is not necessary to replace It. When removing the overcover, be careful not to damage the undercover. When installing the overcover or undercover, it is best to place the deck on two sawhorses with a light underneath. By looking through the screen toward the light, you will easily be able to locate the ribs for nailing purposes. Always stretch the screen tightly. Tight screens give better separation results than loose ones. Finally, inspect the deck trim, aprons, rails, and riffles; and replace what is needed.

The horizontal metal pieces running across the top surface of the deck are called riffles. Riffles assist heavy particles in working uphill by trapping them behind the riffle and allowing light material to flow on over. Riffles are replaced in the same manner at the deck cover, with a riffle lying over each of the wood ribs.

DRIVES

There are three sets of belts and sheaves in your Oliver Gravity. They are: the main drive belts or fanbelts; the idler belt from the fanshaft to the vari-speed unit; and the eccentric belt from the vari-speed to the eccentric shaft. New machines should be checked very frequently for the first few weeks because new belts tend to stretch as they are broken in. To check belt tension, turn off the machine. Then apply pressure to the outside of the belt midway between the two sheaves. The belt should deflect approximately 1/2 inch.

The eccentric belt, from the vari-speed to the eccentric shaft, has a shaft running through it. The shaft must be removed to install a new belt. For this reason, a spare belt is installed around the shaft on all new machines. When the original belt wears out, merely remove the spare belt from its mountings and slip it in place of the original. If the second belt wears out at a time when you are processing and you do not wish to stop the machine for the length of time required to install a new belt, you can replace it with a link belt. However, this is a temporary measure; and it is recommended that the link belt be replaced with standard V belts when it is convenient. Proper tension is maintained on the eccentric belt by the spring action in the vari-speed unit. There is no manual adjustment. If the eccentric belt slips, it is an indication that the vari-speed unit is defective.

VARI-SPEED ASSEMBLY

The vari-speed unit changes the ratio between driving and driven pulleys so the eccentric speed can be altered. It is normal for vari-speed units to wear and should be expected. Most customers get two or three seasons of hard use before it is necessary to replace the vari-speed, depending on the usage. The life of the vari-speed can be extended, if it is operated through its entire range at least once daily. To do this, simply cut off the feed while the machine is running. Turn the crank handle so the eccentric slows down all the way. Then turn the handle so the machine speeds all the way up. Open the feeder and reset the eccentric speed to the proper level.

Replacement of the vari-speed is relatively simple. With the machine running, turn the vari-speed adjustment towards the fastest eccentric speed. SHUT OFF THE MACHINE. Roll the eccentric belt off the pulleys. Loosen the set screws and slip the vari-speed pulley off the shaft. Slip the new vari-speed pulley onto the shaft and tighten the set screws. Install the eccentric belt. Turn on the machine and set to the required speed.

BEARINGS

Your Oliver has several bearings to support the fanshaft and eccentric shaft. We supply sealed bearings for maximum service. However, bearings as well as any moving parts require periodical service to insure maximum life.

The most common problem on new equipment is shaft to bearing contact failure. This shows up as a loosening of the bearing set screws which allows the bearing to turn on the shaft and wear a groove in the shaft. This is due to differences in the expansion rate of the bearings and the shaft as the bearings warm up after startup. It is a more frequent problem in colder climates than in warmer areas.

Check all bearing set screws before the machine is started initially. After the machine has run 8-10 hours shut it down and check the bearing set screws before they have cooled down. After the machine has operated for 100-150 hours shut it down and make an additional check.

Even sealed bearings require occasional greasing for optimum service life. As the bearing warms up grease tends to "boil" out of the bearing. This results in a dry raceway and eventual failure of the bearing. Bearing manufacturers recommend that this grease be replaced periodically. Every 1000-1500 hours the machine should be shut down and greased. **DO NOT OVERGREASE THE BEARINGS**. One or two shots of grease should be given to all bearings. Also, the bearing set screws should be checked at this time. Machines which are under extended or severe service conditions should be inspected every 500 hours and serviced every 1000 hours.

ORDERING REPAIR PARTS

(Note: Parts Order Form in Back of Book)

Oliver Manufacturing Company maintains a complete card file on all of its machines. All Oliver machines have a serial number. When ordering repair parts, to insure that you receive the correct parts, be sure to include the serial number of your machine. Serial numbers are located on the air chest or deck opposite the feeder.

In addition to the serial number, include the model number of the machine and whether it is a right or left hand model.

On left hand models, the good product is discharged from the left hand side of the deck as you face the discharge end of the machine.

On right hand models, the good product is discharged from the right hand side of the deck as you face the discharge end of the machine.

Shipping takes place as soon as possible after the order for parts has been received. The fastest, cheapest method will be used, unless otherwise specified. Incomplete or incorrect information for orders will cause unavoidable shipping delays. If you have a special problem or cannot locate some of the required information, please contact us. We will work with you to provide what you need as quickly and as cheaply as possible. A parts list is enclosed for your assistance.

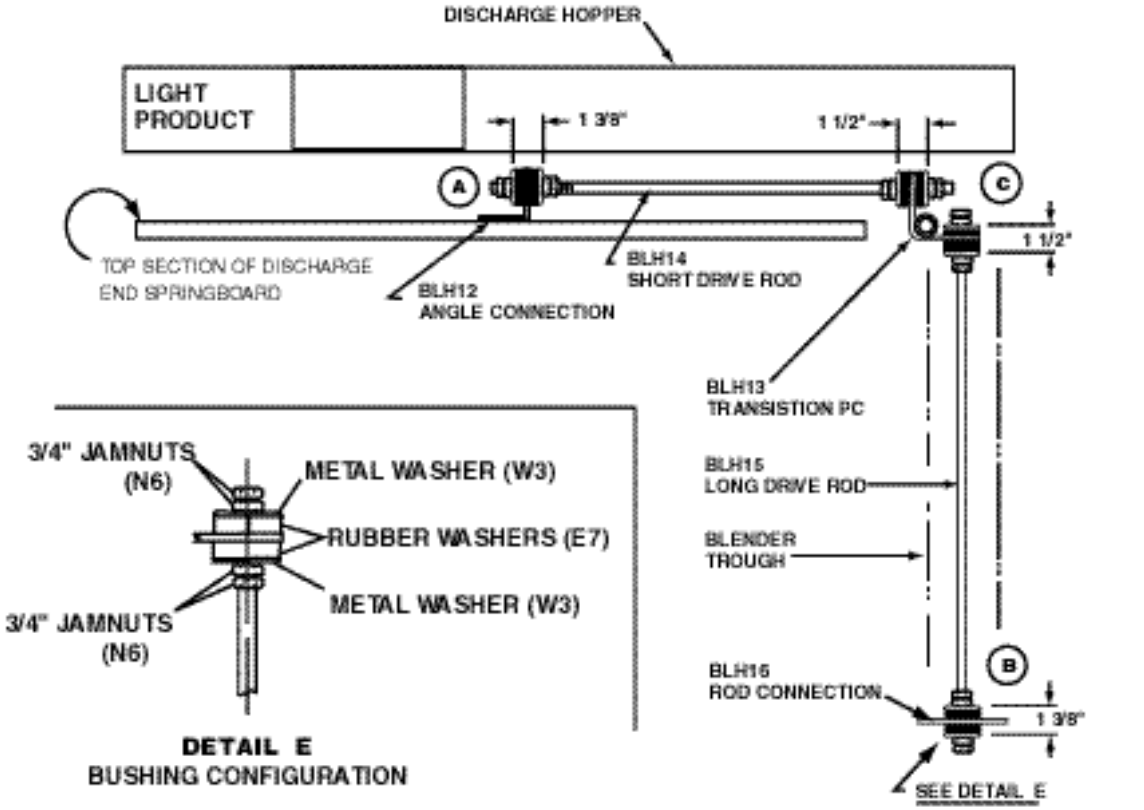
INCREASING THE CONVEYING RATE OF THE BLENDER TROUGH

These instructions will explain how to adjust the drive rod connections on the Gravity Blender Trough. These adjustments will help to increase the conveying rate of the blender trough if it is determined to be too slow.

Refer to the drawing on this page. This shows a simplified top view of the Blender Trough Drive. The areas of main concern are labeled A, B and C. You will note the 1 3/8" dimension on A and B, also the 1 1/2" dimension on C. The bushing assembly at A and B should be compressed to at least 1 3/8", measuring outside the metal washers. If adjustment is necessary, loosen the outside jamnuts, tighten the two inside nuts to compress the bushing assembly to 1 3/8" wide.

At location C do not compress the bushing assembly. The width should be 1 1/2" as shown. If adjustment is necessary at location C, back-off the jamnuts on both the short and long drive rod. The bushing assembly (as shown in Detail E) should measure 1 1/2" wide from outside the metal washers with no compression. Run the nuts up to this point and lock. Again the rubber washer should not be compressed and measure 1 1/2" wide as shown.

After the initial adjustment is made check the conveying action with the machine running. Normally a minor adjustment of the jamnuts at point C will be required for optimum capacity. Typically this will require less than +1/2 turn of the jamnuts from the initial setting. Set the blender for a minimum conveying rate of 6 seconds per foot with an eccentric speed of 500 RPM.



TOP VIEW-BLENDER TROUGH DRIVE SCHEMATIC STANDARD LEFT HAND CONFIGURATION SHOWN

VIII. AUXILIARY EQUIPMENT

MIDDLING PRODUCTS

Many processors ask us what can be done to reduce or reprocess the middling product produced by the Oliver Gravity Separator.

The simplest method of reducing the middle cut is to run the machine at lower capacity. Since capacity and quality are offsetting, it naturally follows that quality of separation will improve when capacity of operation is decreased. By holding material on the deck longer, often separation will be superior enough that the middle product ceases to be a problem.

Many processing factories cannot reduce capacity because of production demands. When adequate storage is available, these plants place the middle and light fractions in a holding bin and reprocess them during periods when more time is available. The advantage of this system is that it allows a high initial capacity during the processing season and allows a little extra time to process the middle fractions more slowly during slack periods. The disadvantage of this system is that storage space is required to contain the middle fractions until they can be processed.

An alternative solution, which eliminates the need to store the middle fraction, is to run the middle fraction back into the processing line and clean it during the regular separation process. Some operators merely connect an elevator from the middle discharge spout of the gravity and run the material back to the feeder. While this is often an acceptable solution, we feel there is a better way. If you want to clean the middle fraction with the initial processing run, we suggest you return the material to the feeder of the screen air machine. Normally the middle fraction consists of small heavy particles and large light particles. The screening action of the screen air machine will improve the condition of the middle fraction somewhat before it is fed onto the gravity. The major advantage of this system is that all the material is cleaned in one processing operation and no bin space is required for the middle product. The disadvantage is that the overall production of the plant is reduced by the amount that is fed back into the processing line.

A final alternative is to use a successive line to clean the middle product during the regular processing action. This should consist of a small screen machine to size the middling product and a gravity separator to finish the separation. This is probably the best solution for large processing plants. It allows for a high capacity primary processing line and a slower more precise secondary line to clean the middle fractions. It also eliminates the need for bin space to store the middle product for later operation. The primary drawback of this system is the initial cost, which is greater because more machines would be purchased. However, the cost will be paid many times over in improved production and quality.

STONERS

Although gravity separators will remove stones and heavy material, they will not always do a complete job. The stoner will separate a stone product that is practically free of the material you wish to clean. Also, it will produce a clean product that is virtually free of stones. Stoners work on the same general principles as do gravity separators. However, they are designed to do a specific job - removing a small fraction of heavy material from a large fraction of light. Normally, stoners cannot be used to grade material as on a gravity separator. Oliver manufactures stoners in a variety of sizes so there is one to meet any specific need.

Normally, two approaches are taken toward destoning: First is the use of a stoner before material is fed onto the gravity separator. (By using this method, all of the material is fed onto the stoner; and stones are removed ahead of the gravity separator. In this approach, the gravity separator is used only to remove light material, producing a very good separation with a minimum middle product.) The second method is to send the product through the stoner after the gravity separator. (In this approach, all the material is fed onto the gravity separator before it is destoned. Then a small portion - 5% to 10% - of the flow is removed from the gravity separator at the rock trap and fed onto the stoner.

The major advantage in using the stoner after the gravity separator is that less space is required for a smaller stoner. A big disadvantage is that the gravity separator may not catch all the stones at the rock trap. If the stones miss the rock trap and the stoner, they will not be removed and will be in the final product.

If you have stone problems with your material, please contact us. We can discuss problems and arrange to have a test sample processed, if necessary.

DUST CONTROL ACCESSORIES

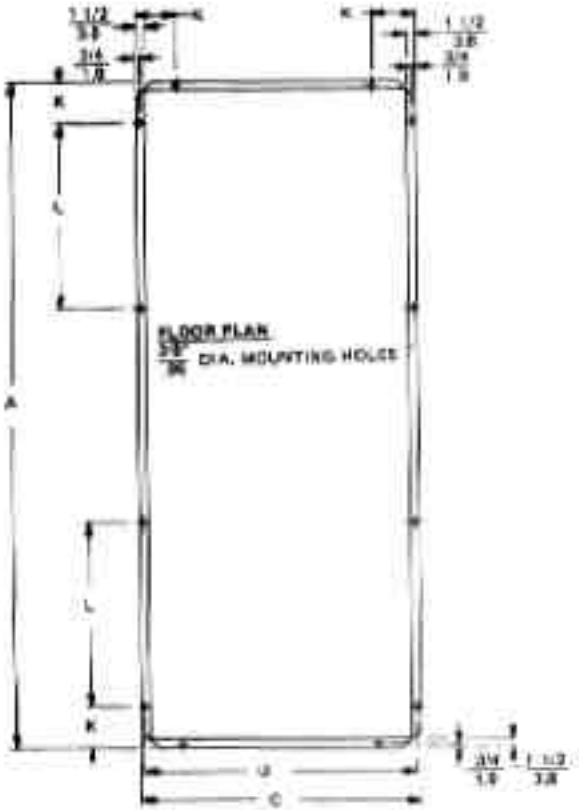
The gravity separator is not intended to be a cleaning machine. With some commodities, dust is still present on the particles when they are introduced onto the gravity separator. This can be both annoying and illegal.

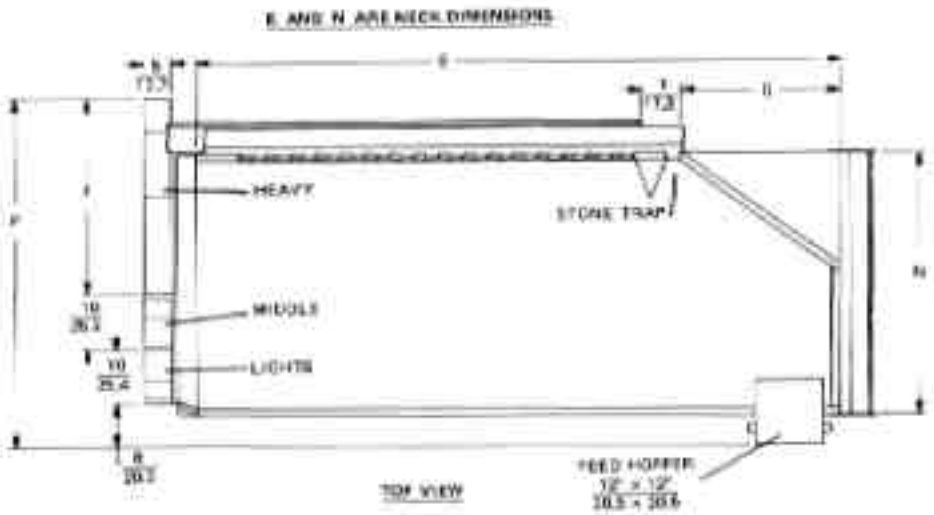
Oliver has two systems to combat dust and get it away from the machine. These are described in the enclosed leaflet on our dust control methods. Please take time to read it, if excessive dust is a problem in your processing.

Oliver Hi-Cap Gravity Separator

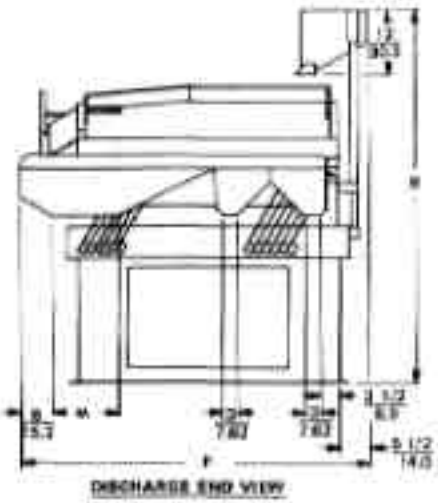
Specs for 9000

return to index

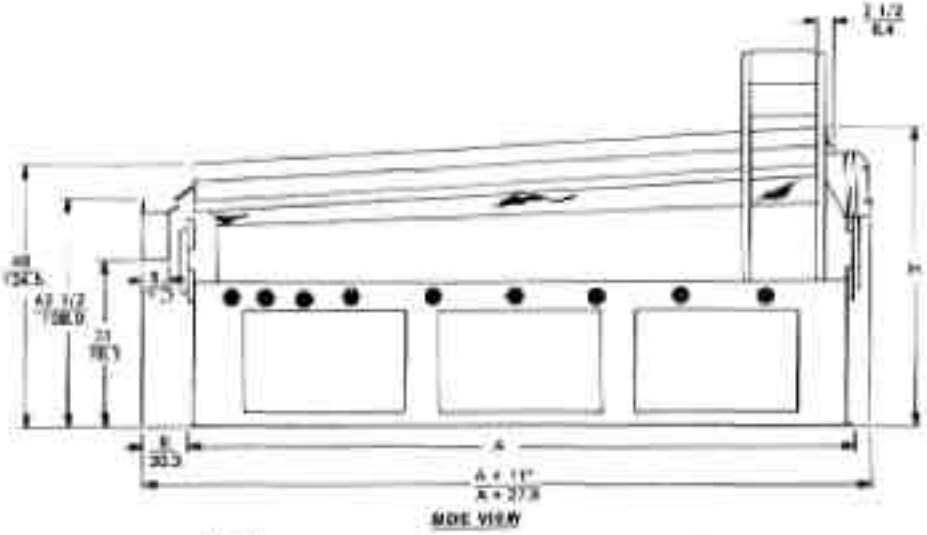




MODEL	80	90	100	200
A	55" 139.7	71" 180.3	86" 218.4	122" 309.9
B	66" 167.6	66" 167.6	83" 210.8	83" 210.8
C	22" 55.9	39" 99.1	45" 114.3	81" 205.7
D	31½" 80.0	37½" 95.3	43¾" 110.8	69½" 176.5
E	60" 152.4	72" 182.9	88" 223.5	136" 345.4
F	52" 132.1	52" 132.1	58" 147.3	84" 213.4
G	17" 43.2	18" 45.7	22" 55.9	37" 94.0
H	95" 241.3	121" 307.3	137" 347.9	137" 347.9
I	36" 91.4	36" 91.4	36" 91.4	36" 91.4
K	4" 10.2	5¾" 14.6	6½" 16.5	7½" 19.1
L	38½" 97.8	53" 134.6	65" 165.1	97" 246.4
M	8" 20.3	8" 20.3	8" 20.3	12" 30.5
N	38" 96.5	56" 142.2	67" 170.1	98" 248.9
Machine Weight	960# 435 Kg	1160# 526 Kg	1350# 612 Kg	1910# 866 Kg
Motor Req'd	5 HP	7½ HP	10 HP	15 HP
Approx. Ins. Diameter	12" 30.5	14" 35.6	16" 40.6	21" 54.0



NOTE: ALL VERTICAL DIMENSIONS ADJUST UP OR DOWN 1 1/2"



DIMENSIONS INCHES CENTIMETERS

STANDARD LEFT HAND MODEL SHOWN

MAR. 87

Oliver Manufacturing Co., Inc.
Post Office Box 512
Rocky Ford, CO 81067 U.S.A.
303/254-7514

OLIVER PARTS ORDER FORM

Purchase #_____ Order Placed By: _____

Ship To: _____ Bill To: _____

Special Shipping Instructions: _____

Credit Information: If you do not have an open account, and wish to establish credit with Oliver Manufacturing, please provide three business references and one bank reference.
Note: Allow two extra days for credit check.

Bank Reference:

Business References:

1.

2.

3.

Machine Model #:_____ Hand: _____ Left _____ Right

Machine Serial #: _____

QTY.	PART NO.	PART DESCRIPTION