

# The Drywasher



**Model 151S Vibrostatic Concentrator (Drywasher) with Hot Air Induction.**

Drywashers are most popular in areas where water is not available, such as dry washes and desert area.

Our state of the art drywasher utilizes air, vibration and static electricity to effectively separate gold from the waste gravel.

The use of vibration moves material through the sluice box is similar to the same movement created by water velocity. This method of dry recovery can be extremely effective when the proper balance of air separation, vibration and static electricity are employed.

The concept of air separation and metered vibration is vital for dry concentration of gold. Keene Engineering has employed an adjustable oscillation system that creates a balance of vibration and air flow. Air induction can create a static charge that will create a conductive field that will attract only heavy metals such as gold. This static charge is created when air is forced through a special fibrous material that lines the recovery trough of the drywasher.

The Keene Model 151S has many patented features to include **“Hot Air Induction Manifold”**, that transfers heat into the drywasher from the engine heat into the drywasher from the engine air Induction manifold into the blower.

This feature can increase the ambient temperature of the air up to 50 degrees. The hot air induction system allows the unit to operate efficiently in damp areas where other machines could not function. Our Vibrostatic Concentrator has been designed with many more advanced principals than regular dry washers.

The concentrator is driven by a high speed blower that forces air through a special plastic tray and cloth where it obtains a constant electrostatic charge.

Some of our new patented features also include: **“Soft Bed Technology”** that creates greater electrostatic charged recovery bed. **“Scrubbing Pins”** for early separation of material and even flow before entry into the recovery tray. **“New Improved Vibrator System”** creating greater vibration at lower engine speeds for increased gold production. **“Blast Gate Technology”** enables the user to make fine adjustments to vibration and air pressure in the recovery container.

As the material is shoveled into the concentrator into a large classifying hopper it automatically classifies the material, allowing only small gravel (approximately 3/8ths. of an inch) to enter the concentrator. The folding support legs are now equipped with **“Vibration Transfer Bumpers”** that transfers energy to the hopper. This vibration assists in moving larger material off the screen faster and eliminating the need to physically drag away excess material from the hopper.

The material is then processed evenly through the recovery tray. The non-magnetic gold and values are attracted magnetically to an electrostatic charged special cloth that lines the recovery tray.

Another feature of this machine is that it can be assembled and dismantled in a matter of minutes due to a folding leg assembly feature. This compact design can also be easily mounted on a backpack frame for ease of transportation

In the past most dry concentration was slow and inefficient. Even today most drywashers will have trouble recovering gold after the top layer of dry sand has been removed and the moist sand material remains.

When the soil is extremely damp, it may be necessary to run your material through the drywasher more than once.

One of the earliest primitive methods of dry washing was known as winnowing. This primitive process was accomplished by screening the coarse material from the fine gravels and then placing the gravels onto a large blanket. The blanket was held by the corners and the material was tossed into the air in a strong wind. The lighter waste material was carried off by the wind and the gold bearing heavier material fell back into the blanket. The weave of the blanket was also useful in trapping fine gold. The blanket was burned and the gold was then extracted.

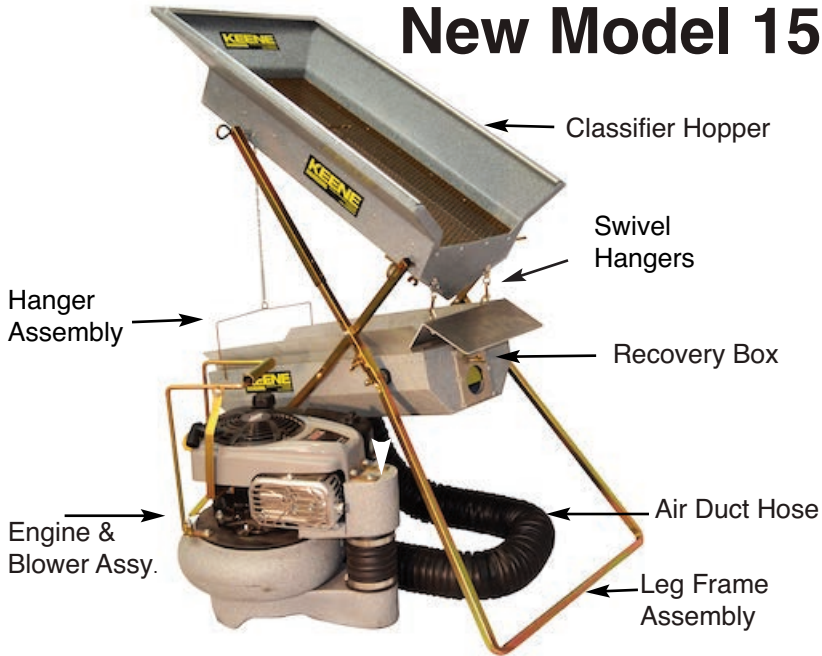
Another method is dry panning, but unless you are very experienced, or have the right equipment values could easily escape.

Another more advanced method of working dry placers is with a simple type bellows drywasher. The gravel is shoveled onto a hopper with a classifying screen and fed into concentrator placed underneath. The larger coarse gravel is classified from the finer material and drops off the lower end of the screen. The smaller material is directed into the recovery hopper and is funneled down through a riffle tray, causing the heavier gold laden material to become entrapped behind the riffles. The flow of the material is aided by air forced upward by bellows that can also be operated by hand or the use of a small motor.

Our Model 140HVS drywasher is a smaller and more compact model. It features all the same equipment as the larger Model 151 with the exception of hot air induction. This Model can be backpacked on a BP5 pack frame. Aside from this model being more portable, it also has the ability to vacuum crevices that would not be accessible without a suction device.

Due to all the new improvements in drywashers of today, it has now become possible to achieve the same fine gold recovery as conventional water based systems.

# General Assembly Instructions for the New Model 151S Drywasher



Shown above is the 151 with legs assembled and folded. This is also the position that is used for packing, transporting and ready for quick assembly.

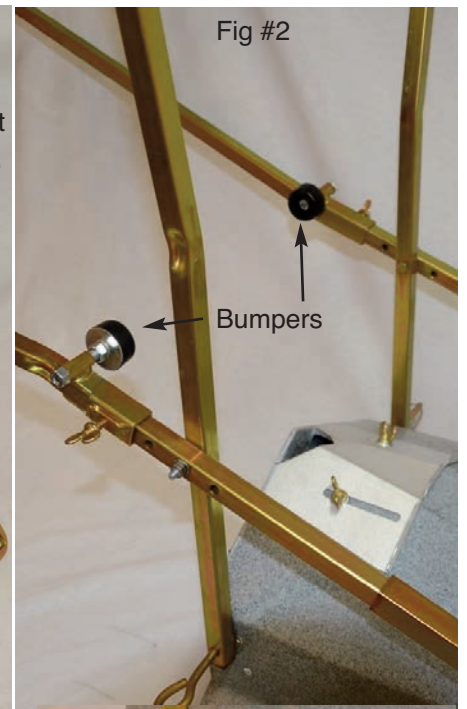
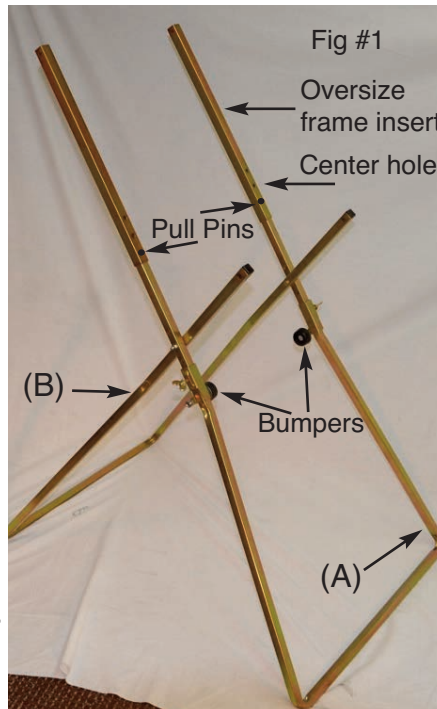
## Step #1

Figure #1 Assemble frame as per illustration. Slide the 2 rubber bumper assemblies on to the (U shape) shorter leg (A).

Assemble leg (A) over the out sided of leg (B) Using the center hole on leg (A) Insert the carriage bolt from the inside out. Place the washer and nylon lock nut on the outside of the frame. Tighten the carriage bolt so the frame is self supporting. Slide the oversized frame extensions over leg (A) and line up with the center hole.

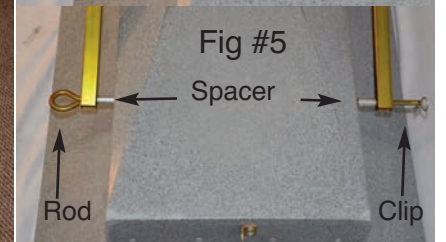
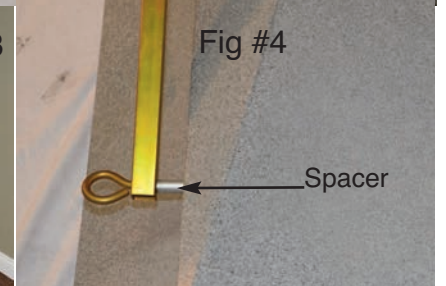
## Figure 2

This illustration shows the proper location for the rubber bumpers.



## Step #2

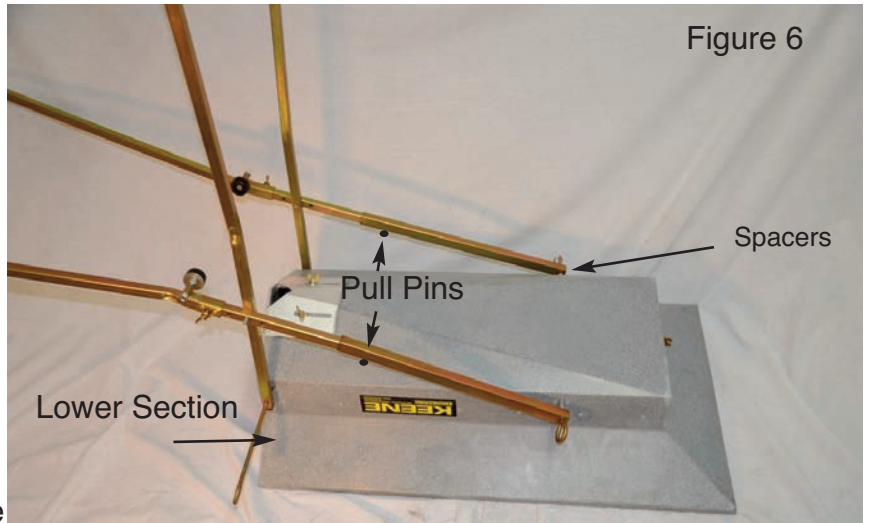
Place hopper upside down on the ground as shown in Figure 3. Set the assembled frame as shown onto the hopper and attach frame (A) to the upper section and insert rod through the frame and hopper as shown in figure 4. Insert aluminum spacer on both sides of hopper and place the clip onto the rod securing the rod as shown in figure 5.



# General Assembly Instructions for the New Model 151S Dry Washer (Continued)

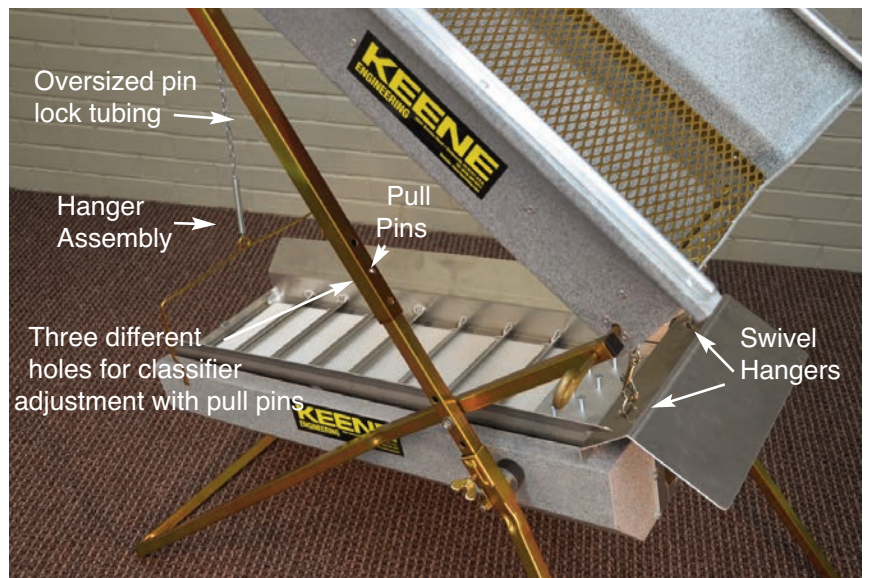
## Step #3

Insert rod into the lower section of the hopper in the same manner as the upper section without spacers. Insert the rod and fasten with clip as shown in Figure 6. Once the frame is assembled you will be able to easily fold the frame against the hopper. The new pull pins allow for quick set up using the three holes to adjust the angle of the hopper.



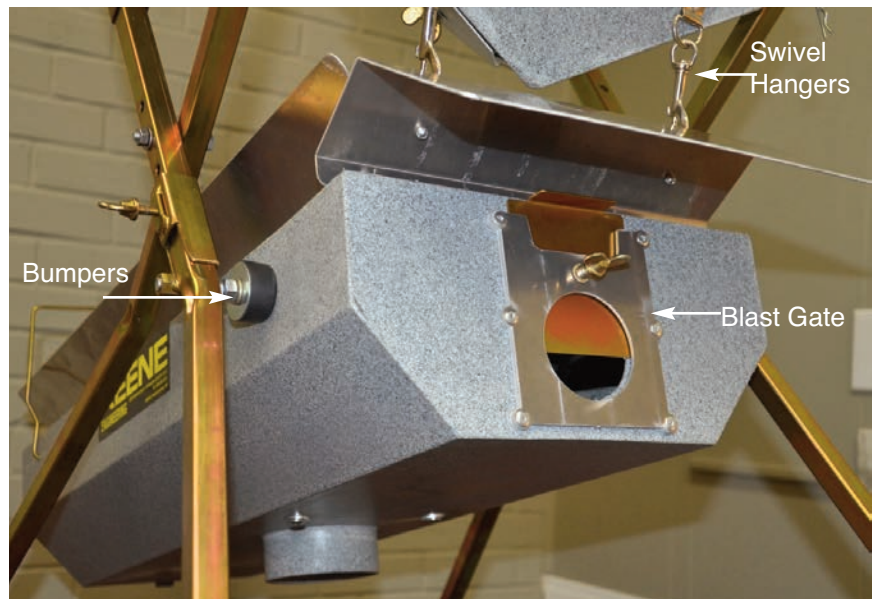
## Step #4

After you have completed Step 3, rotate the assembled frame and hopper right side up and connect the recovery tray. First attach the swivel hangers to the “D” rings located on the rear of the classifier hopper, then attach the hanger assembly to the concentrator and fasten the chain to the classifier hopper. The chain on the hanger should be adjusted once the machine is in operation showing a slow smooth flow as the material passed over the concentrator box. The angle of the hopper can be adjusted by utilizing one of the three adjustment holes in the oversized tubing.



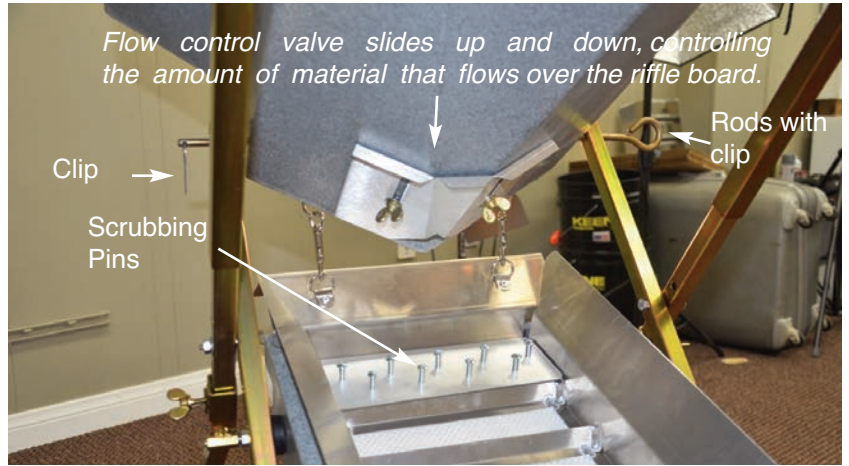
## Step #5

Once you install the recovery box you have to adjust the bumpers on both sides to be snug against the box. The bumpers transfer the vibration from the legs into the hopper. The new vibrating hopper processes material much faster with less work. This also shows the blast gate that adjusts the air flow and regulates the speed of the vibrator fan. When the gate is closed the vibration will operate slower. When the gate is open, more air will pass through the fan thus creating a higher frequency vibration. Adjustment may be required to achieve best results depending on material.



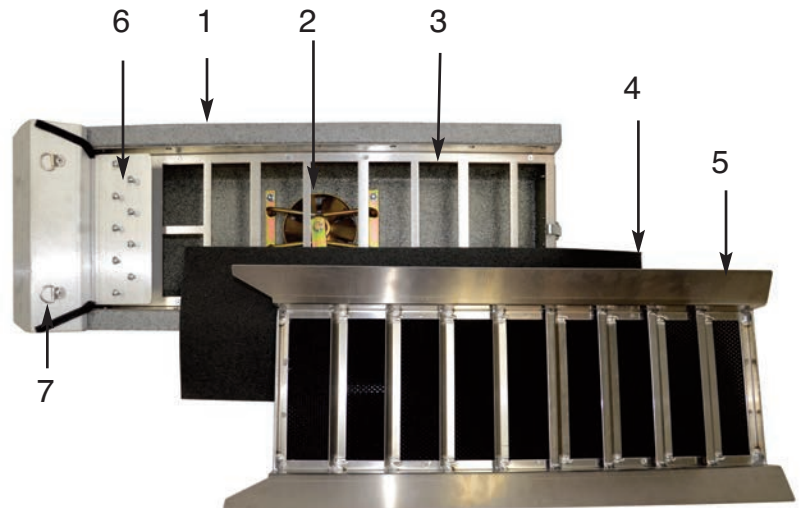
# General Assembly Instructions for the New Model 151S Drywasher (Continued)

This illustration shows the flow control gate for an even flow of material and the large wing bolts for adjustment. Directly below are the scrubbing pins that help liberate stubborn gold from conglomerate type material such as clay and clods. They also assist in spreading the material evenly over the riffle tray for optimum recovery.



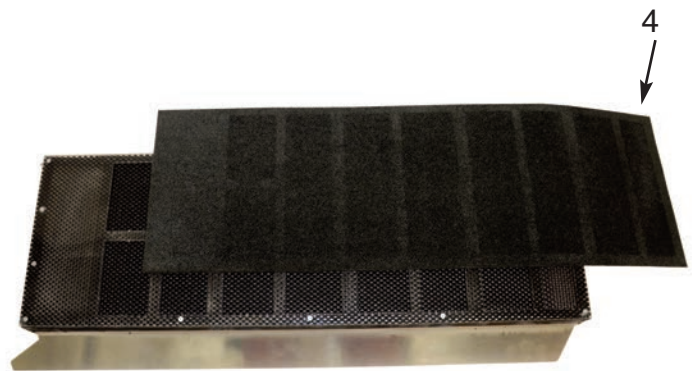
This illustration shows the sluice box and all components.

1. Sluice box
2. Vibrator fan assembly
3. Aluminum riffle board support
4. Riffle board filter pad:
5. Recovery riffle tray
  - a. Aluminum Riffle
  - b. High static poly cloth
  - c. Rubber static support backing
  - d. Lexan dead air space backing
6. Scrubbing pins bracket
7. Sluice hanger D rings.



**Note:**  
Material may become entrapped between the layers of the cloth cartridge during normal operation. We have placed a 1 to 1 1/2 inch opening at the end of the cartridge to allow any debris to be removed periodically. This can be accomplished by holding the board in a downward position to agitate and shake vigorously to remove any excess material.

**151S Riffle Board Assembly (back)**  
This picture illustrates the back side of the riffle board showing the rubber static support backing and the lexan static support backing held together with screws.



- Recovery riffle tray
- a. Aluminum Riffle
  - b. High static poly cloth
  - c. Rubber static support backing
  - d. Lexan dead air space backing

Concentrator tray complete and fully assembled.



# ASSEMBLY & OPERATING INSTRUCTIONS

## FEATURING:

1. **ELECTROSTATIC CONCENTRATION:** As the material passes through the recovery system it becomes charged with an electrostatic charge that attracts gold and other metalliferous values.
2. **SCRUBBING PINS:** The aids in separation and helps liberates gold and creates an even flow of material over the riffle board.
3. **AIR SEPARATION:** Material is held in suspension on a cushion of air allowing the heavier values to drop out of suspension and the excess lighter material to be carried away.
4. **ADJUSTABLE FLOW VALVE:** This feature provides an even flow of material through the recovery system and regulates the flow of material over the recovery tray.
5. **HOT AIR DUCTING:** The hot air from the engine is ducted into the blower providing an important drying effect to the material and assists the electrostatic charge. Only available on Model 151.
6. **BLAST GATE TECHNOLOGY:** Allows slight adjustment of fan speed that changes the vibration and air suspension of material in the recovery tray.

## OPERATING INSTRUCTIONS

1. Read engine manual completely before attempting to start engine. Fill the engine crankcase with the proper type of oil.
2. Start engine, run at lower rpm's and allow it to warm up for a few minutes. Refer to engine manual for starting procedure.
3. Adjust the tilt of the concentrator box approximately 15 degrees, (4 inch drop). This is only a general starting point. Different type of surface ground conditions will require slightly different angles. Attempt to operate the concentrator box as flat as possible, providing the material flows freely over the recovery board and is concentrated properly. For example: if the material is extremely light or sandy, the box may require less angle if the material is large or heavy, it may require a greater angle. If high moisture content exists, it is recommended to operate with less angle and slower speed, to assist the material to dry. It may be necessary to make a second pass through the machine if the material is damp.
4. The blast gate can be open and closed with the large wing bolts. The blast gate controls the air pressure under the riffle board. It also provides some speed control on the vibrator. We suggest that you operate the drywasher blast gate in half open position to start, then adjust as necessary. Fully open provides less air pressure and more vibration. Closed position causes stronger lift in the riffle board for heavier material.
5. Set adjustable flow gate located on the bottom of the hopper. The adjustable flow valve should be set to provide an even flow of material over the concentrator. We recommend that you set it about 40% opening to start. When the flow is appropriate, the riffles in the concentrator will be covered with material and will appear to flow as in a wave motion between the riffles. If the riffles are overloaded, the material will appear to flow in a flat motion across the riffle board. If the recovery tray is under fed, sections of the white fabric will appear visible between the riffles.
6. The new 151S is equipped with the scrubbing pins located on the feed end of the sluice box. Scrubbing pins aids in the separation and liberates stubborn gold thus creating an even flow of material over the riffle board. This makes a big difference when working in areas that have an abundance of dirt clods, clay or conglomerate material.
7. The average operating speed of the engine is approximately 3/4 throttle. As a general rule, it is recommended to operate the engine at a sufficient speed to enable the material to become lightly suspended in a loose and agitating manner over the riffle section. This can be checked by placing your fingers between the riffle sections and checking for any heavily impacted material.

## **ASSEMBLY & OPERATING INSTRUCTIONS (Continued)**

8. Caution must be exercised not to over feed the machine. This may result in potential loss of values. Overloading the concentrator can be prevented by proper adjustment of the flow control valve and blower speed
- 9.. Collection or clean up of concentrates should be performed hourly, or at such time the concentrator seems to become packed with heavy concentrates. This is easily accomplished with the use of a five gallon bucket or a container large enough to hold the riffle tray. Turn the engine off and release the lever holding the riffle tray and lift the riffle tray off and set it to the side. Take a small wisk broom or paintbrush and sweep the material off of the cloth while the riffle tray is removed, we recommend that you strike the bottom of the cloth cartridge with the palm of your hand to remove any dust or debris that may have entered from the blower.

### **Operating Hints.**

Keep in mind when ever setting up a drywasher it is important to always place the engine and blower assembly up wind. This is to ensure any dust that may be generated by shoveling or the machine will not travel towards the engine and blower assembly.

1. To adjust the angle of the sluice raise and lower the chain.
2. The blast gate can be adjusted by opening and closing with a large wing nut. The blast gate controls the air pressure under the riffle board. It also provides some speed control on the vibrator. We suggest that you operate the drywasher blast gate in half open position to start, then adjust as necessary. The fully open position provides less air pressure and more vibration. Closed causes stronger lift in the riffle board for heavier material.
3. Engine and blower assembly require some adjustment. Typically run the engine approximately 75% of engine speed. For heavier material you may have to increase the engine speed up to an additional 10%. For lighter material the engine speed can be reduced. The riffle board assembly slides in until it stops under the lip. Then lock into place with the large latch positioned at the end of the box. Inside the riffle cartridge there is a layer of Lexan plastic, perforated rubber, silk screen material with a backing of a polyester carpet. Each component places a very special part in generating the optimum static charge. Silk screen cloth is one of the toughest materials available, and is very abrasion and tear resistant. The compound of cloth make it the ultimate material for a drywasher due to the high static charge that it generates. The perforated rubber layer vibrates against the silk cloth and provides high levels of static electricity. The Lexan poly carbonate is the perfect material to store the static charge for a strong even charge in the 190,160 and the 151S drywasher. The Lexan material also provides dead air space under each riffle enhancing fine gold recovery. The bottom layer is this polyester carpet that enhances the static charge and also provides a even balance of air flow through the cloth cartridge.

### **IF AIR FLOW OR VIBRATION DECLINES OR STOPS**

If vibration decreases, or stops and the machine appears to not be working properly:

#1. Check the riffle system for the any obstructions in the airflow. This may be caused by particles being sucked into the blower, causing the riffle board to become plugged. To remedy this situation, firmly strike the bottom of the riffle cartridge with the palm of your hand to remove any dust or debris that has caused this problem.

#2 Stop the engine and turn the vibrator slowly by hand, checking for any resistance in the bearing. If the bearing is showing signs of wear it may require replacing.