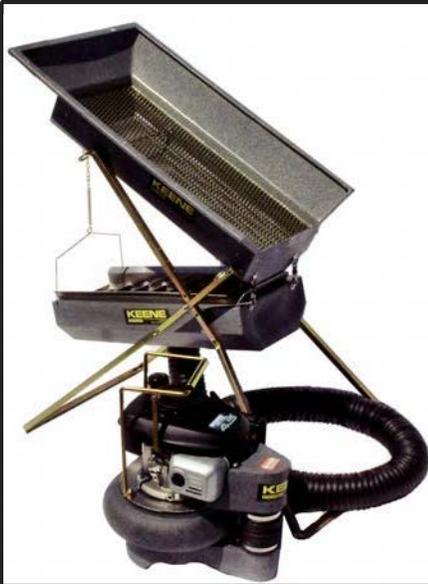


# The Dry Washer

By James Klein



**Model 151 Vibrostatic Concentrator (Dry Washer) with Hot Air Induction. The most advanced dry separator on the market today.**

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

A first of its kind dry washer utilizes air, vibration and static electricity to effectively separate gold from the waste gravel.

The use of vibration to move material through a 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 and vibration static electricity is 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 it is forced through a special fibrous material that lines the recovery trough of the dry washer.

The Keene Model 151 is also equipped with a patented "Hot Air

Induction Manifold", that transfers heat from the engine through the blower into the dry washer. 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.

The Keene Vibrostatic Concentrator has been designed with 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 an electrostatic charge. Material is shoveled into the concentrator through a large classifying hopper that automatically classifies the material, allowing only small gravel (approximately 1/4 of an inch) to enter the concentrator.

The material is then processed through the recovery tray. The fact that gold is non-magnetic, it has an affinity for an electrostatic charge, and is attracted magnetically to the 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 dry washers 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 dry washer more than once.

One of the earliest 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 the gravels, but unless you are very experienced, gold could easily escape.

Another more advanced method of working dry placers is with a simple type bellows dry washer. 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 direction by the bellows that can also be operated by hand or the use of a small motor.

The Model 140HVS Dry Washer 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 dry washers of today, it has now become possible to achieve the same fine gold recovery as conventional water based systems.

# KEENE Engineering Inc. New Dry Washers & Hi Vac Suction System

**Model 140HVS**



**Model HVS**



**Model 140**



**Model 140HVS (Hi Vac Power System with Model 140) Weighs 35 lbs.**

Save with this perfect match for efficiency and portability. Comes complete with 8 feet of 3 inch hose and clamps to connect the two units together and all the accessories to start a dry washing operation.

This combination is the most compact and efficient dry processing machine on the market today!

**Model HVS The New Hi Vac System Weighs 15 lbs.**

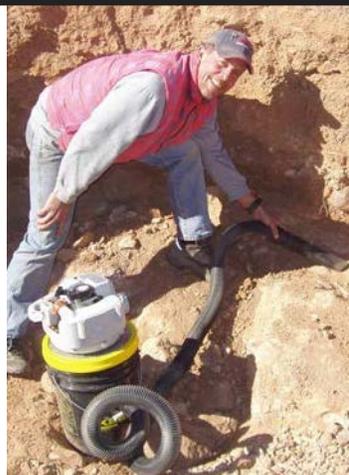
A powerful gas powered dry vacuum system that can power an efficient dry washer and also can literally vacuum and clean gold deposits from cracks, crevices and moss. The perfect power pack for the Model 140 dry washer. Get the all the gold that you have been missing! Runs all day on just one gallon of gasoline.

**Model 140 Dry Washer Weighs 20 lbs.**

Super light weight construction, weighs only 20 lbs, and folds down into a 11inch x 21 inch x 31 inch package. Steel legs fold up into packing position in seconds. Easy to assemble, requiring no tools. Adjustable oscillating vibrator. Dual action riffle design for any gravel condition. Large feed hopper holds up to 2 1/2 gallon capacity. Adjustable flow gate controls flow of material over riffles. Achieve excellent gold recovery with electrostatic charge and oscillating vibration. Large capacity up to 3/4 of a yard per hour.



Folds compactly into optional backpack frame. See BP5 heavy duty backpack



Get into deep crevices and vacuum bedrock for precious values with crevis tool



A lightweight and efficient dry washing machine

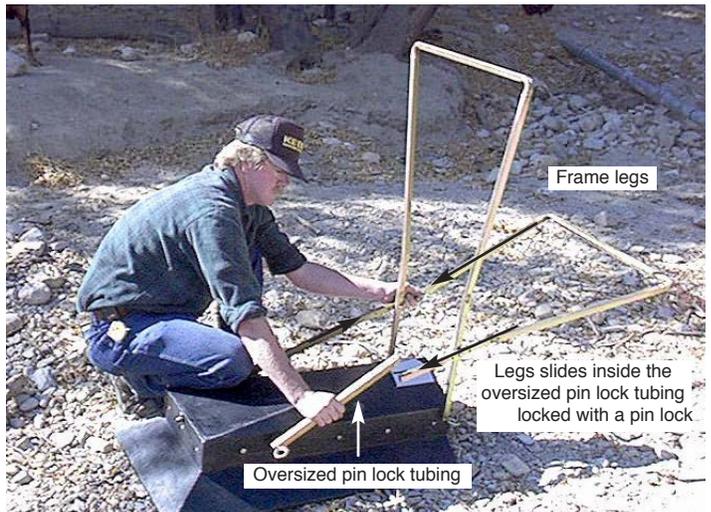
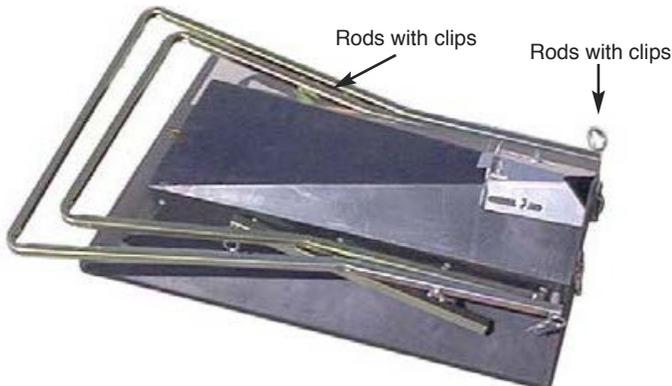


New Positive Seal Avoid air leaks and loose fitting top with new rotating lock seal

# General assembly instruction for the Model 140 & 151 dry washer

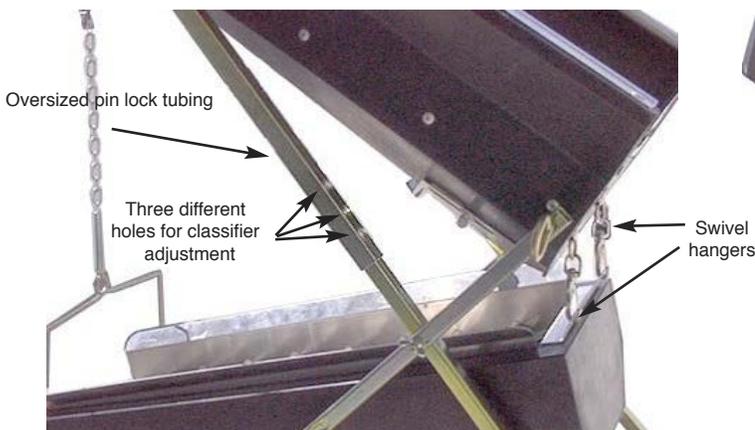


Shown above is the 151 and 140 as it is shipped. This is also the position that is used for packing, transporting and ready for quick assembly. The 140 does not come with the 3 inch air duct hose unless equipped with the "HiVac" vacuum system.



Lift the leg and frame assembly into place as per illustration above. Insert leg into longer tube so that the other side for easier fit. Take caution not to allow the leg to fall on you.

First remove the recovery box assembly and place the classifier hopper face down. Make sure that both rods with the 2 locking clips are in place.

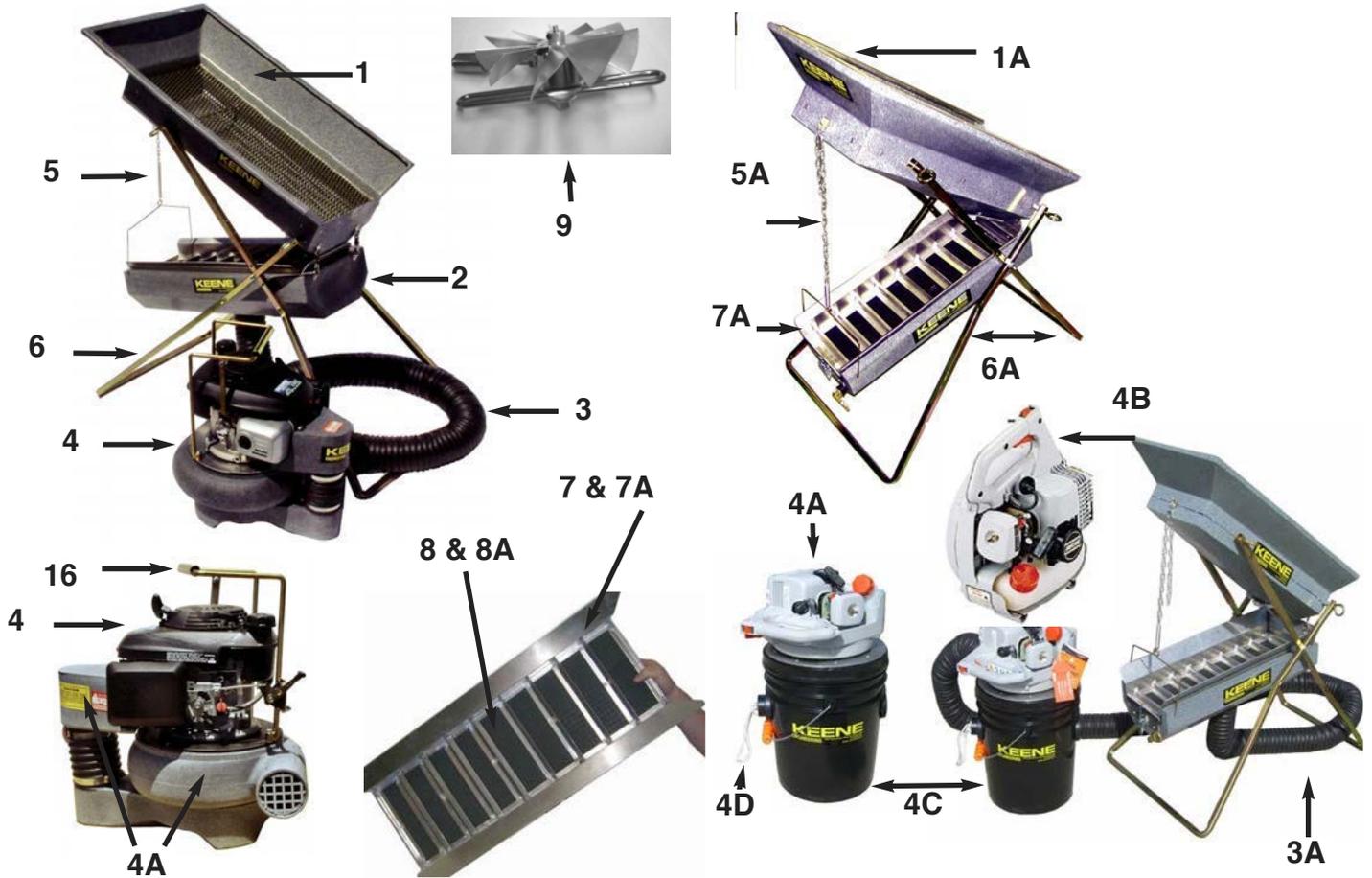


Flip the dry washer back over on the legs and attach the recovery box assembly. First attach the swivel hangers to the "D" rings located on the rear of the classifier hopper, then attach the hanger assembly to the concentrator and hang the chain to the classifier hopper. The angle of the hopper can be adjusted by utilizing the different holes in the oversized pin lock tubing.



Secure the air duct hose to the bottom of the recovery box assembly and engine blower assembly with hose clamps. Check oil and fuel level and then start engine. Start shoveling material into the hopper and adjust the flow control valve so that a smooth even flow of material passes over the riffles. Adjust concentrator tray angle for a slow constant flow of material. See written instructions for more detail on general operation.

# PARTS LIST 151 & 140 VIBROSTATIC DRY WASHER



#	Part # 151	Part #140	Description	Price 151	Price 140
1	151CS	140CS	Classifier Hopper	\$249.95	\$195.00
2	151CT	140CT	Recovery Box Complete	\$379.00	\$255.00
3	151AHC		Heavy Duty Duct Hose 4 inch x 8 feet w/hose clamps	\$70.00	
3A		140AHC	Heavy Duty Duct Hose 3 inch x 8 feet w/hose clamps		\$60.00
4	151EBA		4.5 HP Honda Engine & Blower Assembly	\$685.00	
4A	151BA		Blower Assembly with Heat Shroud	\$245.00	
4B		HVS	2.5 HP Echo engine & blower Assembly		\$425.00
4C		HVSB	HVS without motor and blower assembly	\$199.00	
4D		140BP	Bucket replacement plug and lanyard		\$9.95
5	151SCA		Support chain assembly	\$19.95	
5A		140SCA	Support chain assembly`		\$17.95
6	151FA		Dry washer frame leg assembly	\$175.00	
6A		140FA	Dry washer frame leg assembly		\$149.95
7	151CR		Concentrator riffle assembly	\$115.00	
7A		140CR	Concentrator riffle assembly		\$84.95
8	151CO		151 Electrostatic replacement cloth	\$14.95	
8A		140CO	140 Electrostatic replacement cloth		\$14.95
9	151V	140V	Vibrator assembly complete	\$49.50	\$47.50
10	151VB	140VB	Vibrator bearings only	\$15.00	\$15.00
11	151I		Impeller for blower	\$65.00	
12	151FBK	140FBK	Frame bolt kit	\$ 3.00	\$ 3.00
13	151FKP		Frame locking pin 4 each x \$ 1.00	\$ 4.00	
14		140FKP	Frame locking pin 2 each x \$ 1.00		\$ 2.00
14	151AS	140AS	Aluminum frame spacers 2 each at \$2.00	\$ 4.00	\$ 4.00
15	151RH	141RH	Rear recovery tray clip 2 each at \$ 2.00	\$ 4.00	\$ 4.00
16	151EH		Engine handle	\$24.95	

Not shown  
in  
above  
illustration

## 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. **ADJUSTABLE OSCILLATING VIBRATION:** The adjustable vibrator keeps all the material from packing in the riffle and aids in the separation of fine gold.
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. THE NEW HVS DRY VACUUM AND BLOWER HAS BEEN IMPROVED.

When using the HVS as a blower we have included an additional port on the side of the bucket to reduce the resistance of the air entering the intake, and providing the blower thirty percent more volume. This new feature helps prevent the need to remove the motor and lid assembly when using the blower to produce greater air power to your dry-washer. Now furnished with new "Snappy Grip". An enlarged grip handle for ease of carrying heavy objects. Snaps on with ease.

## OPERATING INSTRUCTIONS

1. Read engine manual completely before attempting to start engine. Fill the engine with the mixture of the required amount and proper type of oil.
2. Start engine, run at low rpm 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 more 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. Set adjustable flow valve to a one third open position. The adjustable flow valve should be set to provide an even flow of material over the concentrator. When the flow is appropriate, the riffles in the concentrator will be covered with material and will appear to flow as in a waving 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 carpet will appear visible between the riffles.
5. 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 over the riffle section. This can be checked by placing your fingers between the riffle sections and checking for any of heavily impacted material.
6. 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.
7. 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 in place. Lift the riffle tray up at about a 45 degree angle and pull it out, being careful not to damage the foam seal on the concentrator box. Lower the riffle tray into a container with the riffles facing downward. Gently tap on the backside of the riffle tray to release the concentrates. This will allow the concentrates to fall into the container. While the riffle tray is removed, we recommend that you strike the bottom of the riffle board with the palm of your hand to remove any dust or debris that may have entered from the blower. Always be sure to clean

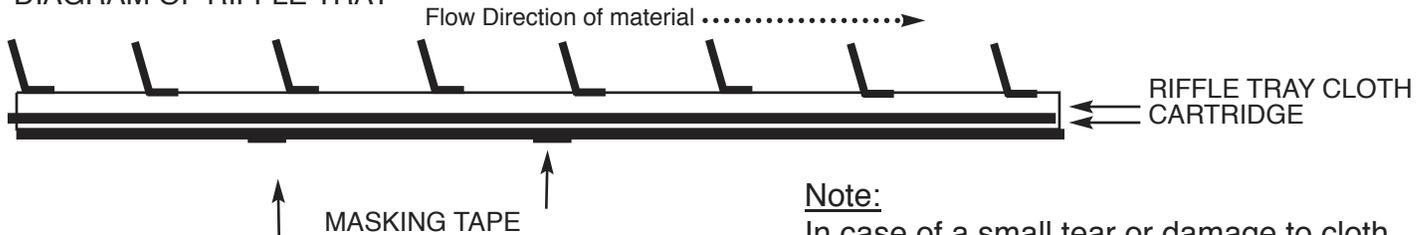
## ADJUSTING THE OSCILLATING VIBRATOR

To make an adjustment to the vibrator, remove the riffle tray, exposing the mechanism. The vibrator can then be adjusted by loosening the two nuts on the vibrator shaft and screwing the counterbalance weight in an inward or outward position. If extremely damp material occurs, it may be necessary to adjust the weight inward to achieve a faster oscillation, in order to assist in breaking up moist material particles.

## MODIFICATIONS

It may be necessary to make a slight modification to the concentrator box by creating a dead air space between a riffle. This could improve fine gold recovery in areas where extremely fine gold and a low concentration of black sand occurs. This is accomplished by placing a narrow strip of masking tape under the cloth cartridge, just before the riffle approximately 1/2 inch wide as per the diagram.

### DIAGRAM OF RIFFLE TRAY



install 1/2 inch strips of masking tape under black cloth cartridge. try taping ever other riffle.

### Note:

In case of a small tear or damage to cloth repairs can be easily made by adding a small dab of silicone to the damaged area.

## 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 board 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.

Note: DUE TO THE WIDE VARIETY OF CONDITIONS THAT OCCUR IN THE FIELD, SPECIAL ADJUSTMENTS AND MODIFICATIONS MAY BE NECESSARY TO ACHIEVE THE BEST RECOVERY POSSIBLE

## Instructions for operating the Hi Vac System Only

1. Read engine and blower instruction thoroughly to achieve a good understanding of operation.
2. The hose and all of the other items can be stored inside the vacuum bucket provided.
3. Before starting engine point the exhaust away from you heading downwind. Dust and exhaust fumes may be hazardous to your lungs. In extremely dusty conditions, always wear a dust mask.
4. Don't let the bucket get more than half full to prevent materials being blown out through blower discharge.
5. Feed material steadily into the vacuum to prevent the hose from clogging. If the hose becomes clogged with material, run the throttle at high speed and tap the hose lightly to dislodge obstruction.
6. It may take several passes with the vacuum to properly clean the area. Material must be loosened and broken up prior to vacuuming. Areas that have previously been worked without a vacuum device often leave values occurring on bedrock and crevices.
7. Although we do not recommend it, this unit can also be used as a wet vacuum, but the corrugations in the hose will fill up, blocking the hose and making it very heavy. Tapping on the hose and running dry materials should eventually clean the corrugations and lighten the hose. It can also be cleaned by washing the hose out with water. Use a wash tub if you want to prevent the loss of material and values.
8. If you find the unit unstable when empty or on uneven ground, put a heavy rock inside bottom of the bucket for stability. The rock will reduce capacity but won't interfere with its efficiency.
9. Be sure to bring lots of water. On a hot day you can become dehydrated.

## REPLACEMENT OF DRY WASHER CLOTH

The cloth replacement of a Dry Washer is made from a special combination of a high content of polyester, nylon and cotton material. Designed to create a static electric charge, thus attracting heavy metals such as gold and platinum.

### Model 151

1. Remove the riffle board from the recovery box. Then remove the screws including washers from the bottom of the riffle board. This will free the plastic punch plate from the bottom of the riffle board.
2. Then carefully scrape off the old damaged cloth. This may require a solvent that will help remove the old adhesive material. An abrasive pad may sometimes be necessary to remove the old adhesive glue. It may also be necessary to use an adhesive release agent that can be found at most hardware stores.
3. Once the bottom of the riffle board is clean, take some standard contact cement and re-coat over the old clean areas. Take care not to allow the contact cement to drip onto the back-side of the riffle board.
4. Place the new cloth over the back-side of the riffle board and stretch by hand until tight or to minimize wrinkles in cloth. Allow the contact cement to cure and dry for the recommended time. Trim off excess cloth with a razor knife. Fig #2
5. The plastic punch plate will be needed to be replaced by reinstalling the screws and washers as removed. Place the riffle board against a wall with the riffles facing upwards. Apply the included E6000 adhesive in the form of a 1/8<sup>th</sup> inch bead to the bottom portion of each riffle thus forming a seal. Fig #3
6. Place a dab of E6000 over all screw tips to avoid any sharp edges protruding into the riffle area to avoid injury from sharp objects. Fig #4

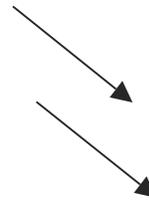


Figure 1

Figure 2

Figure 3 Model 151 Only

Figure 4

Completed Unit Figure 1

### **The model 140 & the DW2 series do not use the plastic punch plate.**

1. Remove the riffle board from the recovery box. Fig #1
2. Carefully scrape off the old damaged cloth. This may require a solvent that will help remove the old adhesive material. An abrasive pad may sometimes be necessary to remove the old adhesive glue. It may also be necessary to use an adhesive release agent that can be found at most hardware stores. Fig #1
3. Once the bottom of the riffle board is clean, take some standard contact cement and re-coat over the old cleaned areas. Take care not to allow the contact cement to drip onto the back-side of the riffle board.
4. Place the new cloth over the back-side of the riffle board and stretch by hand until tight or to minimize wrinkles in cloth. Allow the contact cement to cure and dry for the recommended time. Fig #2
5. The Model 140 does not include the plastic punch plate. Fig.3
6. Apply the included E6000 adhesive in the form of a 1/8<sup>th</sup> inch bead to the bottom portion of each riffle thus forming a seal Fig #4
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