



715 West Colton Ave
Redlands, CA 92374
Phone 909-793-6636

e-mail us @ info@covington-engineering.com

INSTRUCTIONS FOR 8-10" HORIZONTAL COMBINATION UNITS



INTRODUCTION

The horizontal combination lapidary unit is a complete machine designed to saw, grind, sand and polish gemstone material.

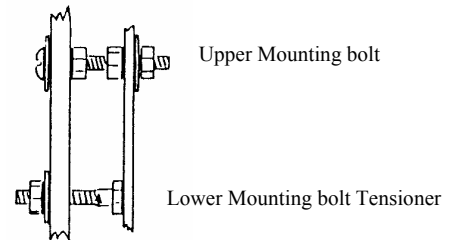
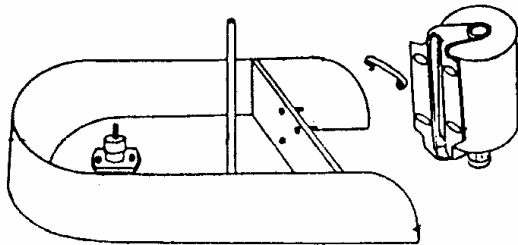
DESCRIPTION

The unit is made with heavy cast aluminum chassis and has a beautiful forest green finish. Arbor has a 5/8" - 18 R.H. thread shaft with precision ball bearings, neoprene sealed and greased for life. Heavy duty 1/3 HP, 110 V, 60 hz motor drives arbor at 1410 RPM. (Sold Separately)

Horizontal combination unit comes complete with super-charged diamond blade, grinding wheel, aluminum polishing disc, 3-3/4" rock vise, drip can water system, carry handle, weight feed cord and a scale. Sample kit includes koolerant, polish powder, brush, dop stick, dop wax, instructions and guarantee.

INSTALLATION

Before plugging your unit into your electrical supply, read the Covington Safety Demand Sheet. The unit base should be located on a sturdy, level bench to avoid vibration.



Install motor with the shaft down using the two lower slots of the motor mount. Install the carry handle in the two upper slots. Next, install and align motor pulley with the machine drive pulley under the machine housing. Rotation of the arbor shaft should be counter-clockwise, motor shaft clockwise. Install V-belt and adjust belt tension as necessary using the mounting bolts. Secure V-belt guard in place.

CABOCHON CUTTING

Cabochon cutting may be divided into four separate operations. (1) Sawing, (2) grinding, (3) sanding, (4) polishing. The rough gem material as found or mined often requires reduction to proper size, hence sawing is usually the first operation. The grinding wheels reduce the stone to the proper shape, while the sanding and polishing operations give the surface of the cabochon a smooth and glossy finish.

SAWING

Blade Mounting: The flange must fit snugly and evenly against the blade. Make sure there is no dirt between the collars. Dirt forces the blade out of alignment causing it to warp.

Load Vise: For convince, the vise may be removed from the mounting staff. Securely clamp the rock in the vise. Adjust the collar on the staff so that vise and stone are in cutting position.

Water Can: Fill the water can with koolerant mix. During cutting, the saw blade and rock must be kept wet. Never run the diamond blade dry.

Weight Feed: Tie the cord in the hole provided on the end of the vise jaw. Lead the cord over the slot on the round end of the tank. Tie the weight scale to the end of the cord and hang the required weight on the scale. Use about three (3) pounds of weight for each inch of blade contact with the rock. A one gallon can with rocks makes an excellent weight.

Sawing: Hand feed the rock into the blade to a depth of ¼” or until a good free running cut has been established. Also hand feed the last half inch of the cut to minimize slab breaking and blade damage. It is a good idea to swing the rock and vise back away from the blade occasionally so that koolerant can reach the rim of the blade. When finished, remove the vise and blade, clean and store in a dry place. Remove the cut slabs from the tank.

DOPPING

Wash the slabs with a detergent solution to remove all traces of cutting oil. While the slab is still wet, use a template and metal marking scribe to trace the outline of the cabochon pattern. Cut out the preform and then grind almost to the outline. Make the edges perpendicular, not beveled.

Prior to finish grinding and sanding, mount or “dop” the preform stone on a small round wooden stick. Mounted in this fashion, the stone is much easier to handle in the final grinding, sanding and polishing operations.

Melt some dop wax over a heater or in a dop stove and at the same time warm the stone. Dip the end of the stick into the melted wax and press on to the bottom of the preform to be worked. As the wax cools, it will form a hard bond with the stone. To remove the stone from the stick, place the cabochon end in ice water.

GRINDING

Mount the grinding wheel in the same manner as the saw blade. Leave the labels (blotters) in place as they protect the wheel from the metal flanges. Start the flow of koolerant over the wheel. Use one side of the wheel for making curved surfaces on preforms and the opposite side for flat surfaces. When grinding, keep the preform moving at all times and use the entire surface of the wheel. This will prevent you from grinding flat spots on the stone and grooves on the wheel.

Grind away the material around the outline. Use light pressure. This is the operation which will establish the final shape of the cabochon. Be completely satisfied with the preform shape before sanding.

When finished, turn the koolerant off and allow the wheel to spin out excessive fluid. This is necessary to preserve the balance of the grinding wheel.

SANDING

Mount the aluminum sanding disc in the same manner as the grinding wheel and sand wet. The sanding cloth will remove the lumps and scratches left by the grinding process and give the cabochon its final shape and size. Pay particular attention to the bezel, or edge of the stone.

To sand, rock and rotate the dopped stone against the surface of the sanding disc. Do not hold the stone still at any time or you may deform the contour or develop a flat spot. Use light to medium pressure.

After sanding, dry the work piece and inspect under a bright light. All scratches and blemishes must be removed during the sanding process.

Even though it means purchasing an extra aluminum disc, a 600 grit silicon carbide or a 1200 grit diamond cloth faced disc is an excellent way to smooth the work piece before polishing. Again, rotate the work piece against the revolving sanding disc. Fine grit should only be used to remove slight imperfections and hairline scratches.

Before polishing, carefully clean the tank and arbor to remove all traces of grinding or sanding grit as well as sludge or rock particles. Contamination of the polishing disc can make finishing the cabochon impossible.

POLISHING

The final step is polishing. Install the aluminum polish disc. Polishing does NOT remove any material. If scratches develop, the stone must be re-sanded.

Polish Powder: Mix some polish powder with water to the consistency of cream. Brush this mixture on the buff. Another method is to dip the gem into water and then the polish powder. The powder will transfer from the stone to the buff during polishing. Work the stone on the buff with light pressure. The buff can be moist or dry, but not wet. Occasionally you may need to add powder to the buff (use sparingly). **IMPORTANT: Do not allow the stone to get too hot.**

No one polish powder is effective on all stones. Determine the best polish powder for the mineral work piece.

HELPFUL HINTS ~ HARMFUL ERRORS

Whenever you change from one grit to another, be sure to wash your hands, the stone, and the dop stick. This is very important. If a grain of coarser grit is carried to a finer grit cloth, it can make an ugly scratch on the gem. Washing is especially important between sanding and polishing operations.

Aluminum Disc Head: The leather, felt or sanding disc is installed on the rubber face of the head with a tacky adhesive such as "Stick-N-Peel". This type of adhesive will permit easy removal of the disc when worn out and installation of another.

MAINTENANCE

Lubrication: Unpainted parts such as the arbor face and upright staff inside the tank should be greased to prevent rust.

Oil the electrical motor once a year with a few drops of 10-30 motor oil.

Do not oil or grease the arbor bearings. The bearings are sealed and greased for life.

Blade: Sharpen the blade occasionally to prevent glazing over. This can be done by making several cuts into an old 220 grit silicon carbide wheel, a carborundum stick made for that purpose, or a soft, porous red brick. The blade should be reversed periodically. Stopping and restarting in the middle of a cut almost always leaves a blade mark on the work piece.