

# Jowitt & Rodgers Company

## Blanchard Table Grind Procedure

by Mike Petsch

### Objective

This procedure is designed to resurface a Blanchard rotary chuck using the abrasive wheel mounted on the grinder. Upon completion of this process the chuck face will be flat within .0005" and perpendicular to the vertical axis of the grinding wheel. The chuck will be rough and free of burrs to prevent parts from sliding during the grind.

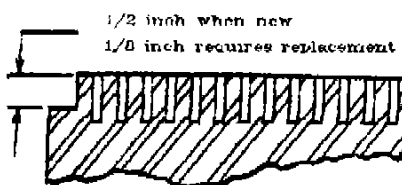
### Equipment Required

Try to obtain as much equipment from the following list as possible. Gathering all of the required tools will make the job very simple.

1. Special Grinding Wheel - Jowitt & Rodgers W36DB1
2. Paint Marking Sticks
3. Straight Edge {Length same as chuck diameter}
4. Test plate 12 x 12 x 3/8 inch square
5. Grind Blocks (4) total 3 x 3 x 3 inch cube
6. Dial Indicator (.001") and Magnetic V-Base
7. Double end Blanchard Wrenches for Adjusting Nuts
8. Pry Bar and Hammer for Chuck Ring removal
9. Feeler gauge .001, .002, .003, .004, .005 ... .010 inch
10. Hone Stone for burr removal

### Preparing the Chuck

Remove the ring that is pressed around the OD of the rotary chuck. Check the step on the edge of the chuck, and consider replacement if the step is less than 1/8 inch.



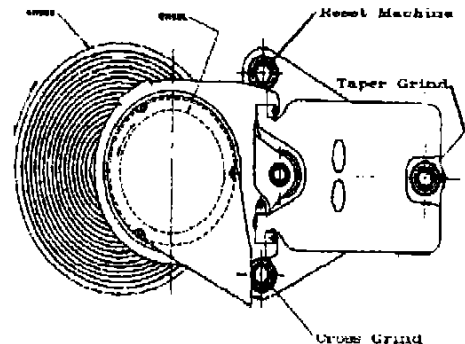
The chuck is very expensive. The current cost for a 36 inch diameter chuck can be as high as \$15,000. Since there is only 3/8" usable depth on the chuck, it costs about \$40 for every .001 inch removed from the chuck.

Lay the straight edge across the table. Determine if the table is concave, convex or some combination. Check flatness by sliding a feeler gauge under the straight edge. If a .001 inch strip fits tight under the straight edge across the table, you probably do not need to resurface the chuck. If you do not believe a positive test result because your parts are not very flat, try rotating the straight edge 90 degrees and measuring again with the feeler gauge.

If you find the table out more than .001 inch, you may need to regrind the table to improve the flatness of your parts. You should allow somewhere between 1/2 hour and most of the day to regrind your chuck.

### Table grinding Set-up

The Blanchard is set up with a 3 point leveling system to align the grinding head with the rotary chuck.



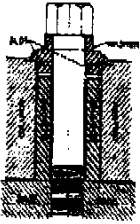
Plan of 3-point Column Support

Turning each of the three adjustment screws will allow you to level the grinding spindle with the rotary chuck. The front screw is located under the handwheel and is used to obtain a Cross Grind. The end screw is opposite the chuck and is used to obtain a Taper Grind correction for a concave or convex chuck. The reset screw in the back of the machine is not usually used.

The reset screw is only used when there is no longer any adjustment in the other screws. All of the screws have 1/8" total adjustment range. You will hopefully

find the position of all screws somewhere in the middle of there range, or you will have to go through the tedious procedure of completely dropping the machine and raising up all three screws by .060 inch before you start the alignment procedure.

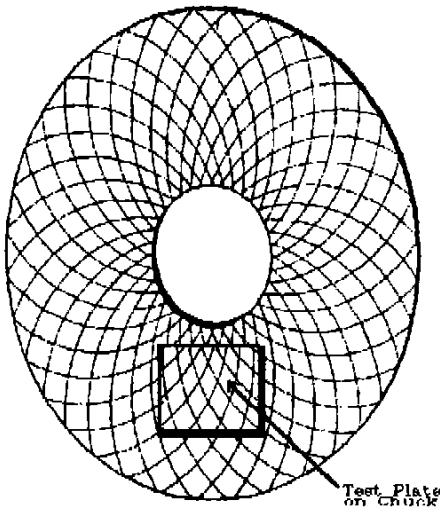
The Blanchard adjustment screws consist of upper and lower hex bolts. The upper hex nut lock and unlock the setting, and the lower larger hex nut moves the head up and down. Each mark on the lower nut plate is about .001 inch. You should use a dial indicator on the grinding head to make sure that you are actually moving the head in the proper direction, because the upper lock nut, will deflect the setting of the lower nut. The Blanchard adjustment screw is shown in this drawing.



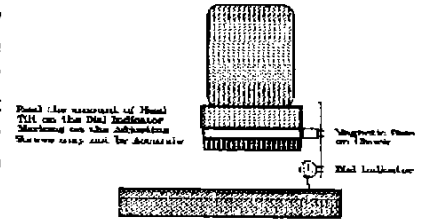
Section Through One Support Pedest

### Grind a cross hatch

Change the grinding wheel to the softer and coarser W36EB2. Place the 12 x 12 inch square test plate on the chuck. Mark the entire test plate with your paint stick and grind to clean up. Your grinding wheel should break both the center and OD of the chuck when your table is correctly positioned. Adjust the grinder using the front cross grind screw until you obtain the cross hatch pattern shown below:



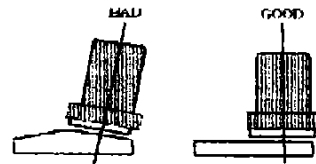
You may find that the dial indicator is helpful to determine the direction and magnitude for the adjustment screw. The dial should be placed near the adjusting screw between the spindle and the rotary chuck for best results. Attach the magnetic base to the steel area on the wheel mounting plate.



The grinder is level in this axis when the grinding marks are equal in both directions. We now have to get the grinder level in the opposite axis.

### Correction of Taper (Convex or Concave)

You will probably have to adjust the taper screw also because operators move this screw to compensate for chucks that are not perpendicular to grinding spindles. It is entirely possible to grind good parts with a chuck that is not flat as shown by the drawing below:



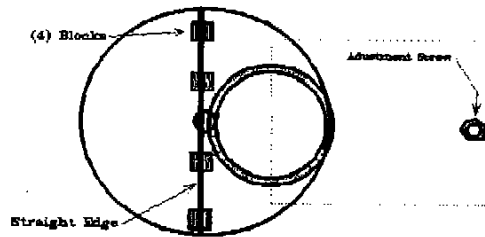
Make sure the spindle is Perpendicular to the Base of the Magnetic Chuck

We need to get the spindle square with the base of the table before we can grind the table. The easiest way to do this is to grind our four blocks and check them. This procedure will save making test grinds on your chuck.

Mark each of the block with your paint stick and grind to clean up. The block are arranged in a row across the diameter of the chuck The grinding wheel should break both the center and the outside edge of the chuck when your table is correctly positioned.

Lay your straight edge across the blocks as shown and check for a convex or concave condition using a feeler gauge. Set up the four blocks as shown on the drawing on the next page:

Make adjustments using the taper grind screw found on the end of the grinder. You will find the dial indicator very useful when making adjustments. Keep checking with your straight edge across the blocks using your feeler gauge. When your .001" feeler gauge will not slide between any block and the straight edge you should have the head aligned with the base of the chuck.



Correction of Taper (Convex or Concave)

You should verify that you still have a cross hatch pattern by grinding your test

12 x 12 Inch square one more time. Sometimes if you have to move the taper adjustment a large amount it is possible to lose the cross hatch. If everything still looks good, you are now ready to begin grinding the table.

### Grinding the Table

Rule number one for grinding table should be to move the table into position under the wheel and leave it there. Your grinding wheel should break both the center and OD of the chuck when your table is correctly positioned. You should be able to check the flatness of your table without moving it. If your ways are worn, you will get funny grind marks if you move the table at any time during the grind, so why chance looking like a fool.

Rule number two for grinding a table is to remember that you do not want to put any heat into the table. Watch your downfeed rate as the wheel starts to clean up the entire table. You do not want to warp the table or destroy the chuck coils by creating too much heat. Your special Jowitt & Rodgers table grinding wheel will help reduce this problem, but keep your amp load under 50% if possible. You may find that your downfeed may be as low as .004 ipm before you finish grinding the chuck.

Rule number three for grinding a table concerns the finish you are trying to get. Do not grind the table too smooth. Keep it rough enough that the parts will not fly off the table. Avoid sparking out on they table by raising the head quickly when finished.

If you have aligned the head properly, the actual table

grinding process is easy. First mark the table with your red paint stick and then start grinding. Keep the coolant on during the grind.

You may want to hand feed at first, but watch the amp loads and switch to automatic feed before the table starts to clean up. Start with a .012 ipm and work down to .004 ipm if necessary.

Check the table by placing the straight edge across the center of the chuck and slipping your feeler gauge

under the straight edge. Try not to move the table in or out when checking with the straight edge. Keep the grinding wheel in the same position relative to the chuck. When a .001 inch feeler strip will not go under the straight edge, you can quit grinding. The chuck should now be resurfaced and flat enough to produce good parts. Stone any burrs remaining on the table, but leave it in a rough condition.

Check the table ways relative to the chuck by using your dial indicator. Mount the indicator on your wheel chuck with the probe turned toward the center of the chuck. Move the rotary table in and note the reading on the dial indicator. The needle on the dial indicator should not vary by more than .001 inch, if your table is both ground flat and your ways are in good condition.

### Set-up the grinder for production

Replace the Chuck ring back around the diameter of the table. You are now ready to grind production parts. You may need to return the grinder to your best production set-up. Most grinders do not run well with the wheel spindle aligned to the rotary chuck. If you wheel suddenly acts harder after grinding the chuck, try tilting the grinding wheel head. Blanchards remove stock quicker if the back edge of the wheel is tilted down and the leading edge of the wheel is raised slightly (.005 inch). This progressive grinding action relieves some of the pressure on the wheel and increases grinding performance. It also puts a slight dish into your parts. An 18 inch diameter wheel gives a .0003 inch dish over a 12 inch band of parts with a .005 inch tilt.

