

Titan and Genie Users Manual



Important Safety Instructions Please Read Before Operating This Machine

Rock dust can be hazardous to your health. Use sufficient water at all times.

Before grinding and polishing any material be aware of the possibility that they may contain toxic quantities of such substances as uranium, lead, mercury, arsenic, asbestos, copper sulfate, etc.

Use safety glasses to protect your eyes.

The motor runs hot to the touch. Avoid contact with the motor while in use to prevent possible burns.

Introduction

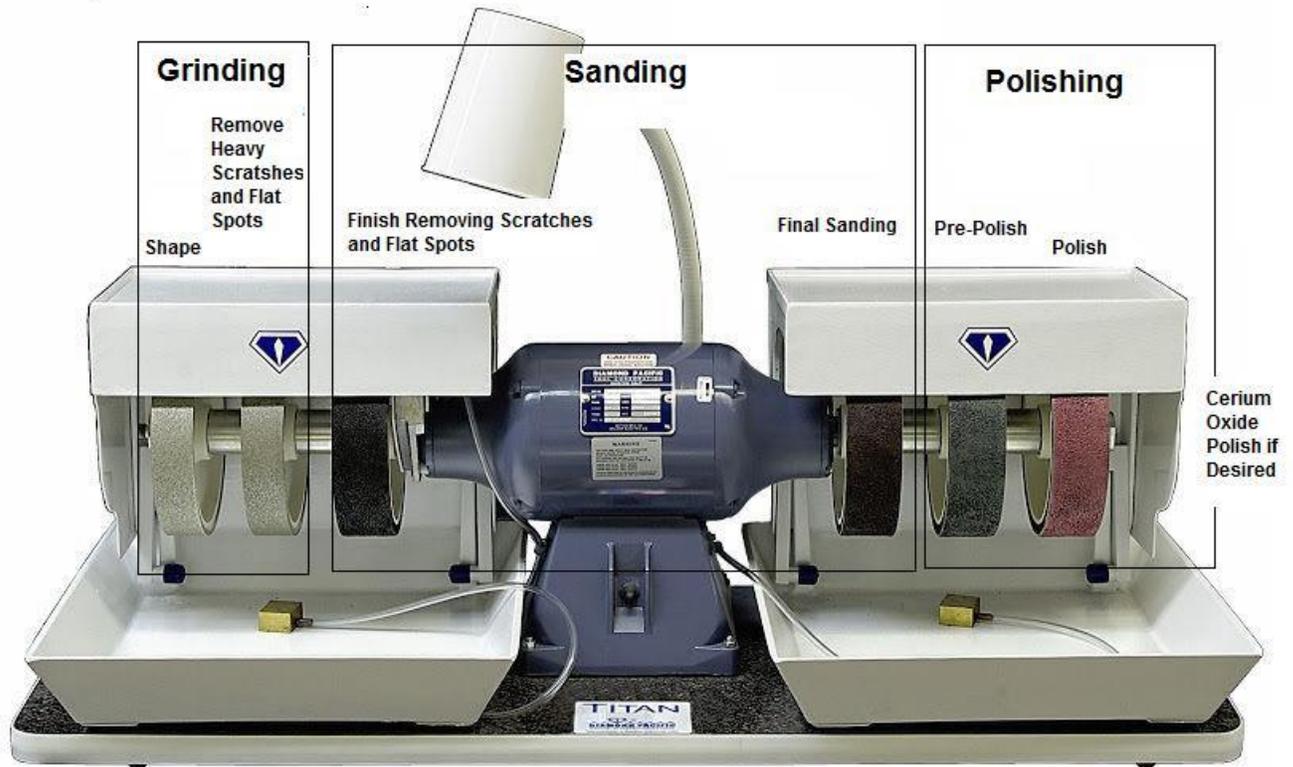
The 8" Titan and 6" Genie are cabochon grinding and polishing machines complete with motor, diamond wheels, and water system.

They come with two metal-bond diamond grinding wheels: one 80/100 grit for coarse grinding, and one 220/400 grit for fine grinding. The set of four resin-bond diamond sanding and polishing wheels (grit sizes 280, 600, 1200, and 3000) is an excellent all-around combination that will produce a high polish on most stones.

For stones that may benefit from an additional polishing step, a polishing pad is attached to the right hand shaft.

The user should be able to shape and polish most stones in a matter of minutes.

How to Make a Cabochon



Remember How Each Wheel Is Used

- First Wheel:** To grind stone to shape
- Second Wheel:** To grind out heavy scratch marks and flat spots
- Third Wheel:** To sand out all minor scratches and flat spots – 2 min. max.
- Fourth Wheel:** To sand a sheen on the stone – 2 min. max
- Fifth Wheel:** To pre-polish – 2 min. max
- Sixth Wheel:** To polish - - 2 min. max
- Polish Pad:** Use if desired. May add additional luster.

The Titan and Genie are only used to make Cabochons or stones that are rounded on top. Stones without a curved top will not sand or polish correctly on these machines. Instead, use our Faceting Machine as a flat lap.

These wheels may not be used to grind “windows” into rough rock. Instead, use the Old Grinder setup for this purpose.

Sapphire, Ruby, Emerald and other Corundum material may not be cut since these materials will quickly wear-out Diamond wheels.

Step 1. Choose a Slab



- Slabs should generally be between 1/4" to 3/8" thick, depending on the size of the cabochon to be created. Use thicker slabs for cabs larger than 30x40 mm or when a high dome is desired.
- Don't use slabs that have cracks or pits. Slabs should be examined both wet and dry. While a slab is drying, cracks and pits will retain water and be most noticeable.
- If you see a crack, try breaking the slab with your hands. A weak slab will separate on the fracture line.
- Most cabbing material looks best wet. A wet slab most closely resembles the look of a polished one. Reject any slab that feels gritty or that dries out too fast. It may be too porous to take a good polish.
- The hardness of the minerals in the slab will affect how the material needs to be worked. Softer materials must be worked with a much lighter touch
- Reject slabs that have both hard and soft areas. The softer areas may undercut or cut faster than the harder areas, which affect the shape and polishing. Common materials with this problem include unakite, rhodonite, charoite, and some jaspers and agates.
- Be aware when cutting rutilated or tourmalinated quartz that pits may be revealed as the rutile is exposed during grinding.

Step 2. Mark, Trim and Pre-form the Stone



Use a template and ultra-fine point Sharpie to mark the bottom of your stone

Mark the “cut-lines” about 1.5mm (1/16”) from the template mark.

Use the Trim saw to cut outside the “cut-line” to ensure you are at least 1.5mm from the template mark.

Trim saws only cut straight lines. If you twist the slab it will bind and damage the blade, and perhaps hurt you..



Start the cut by using medium pressure. Push the slab into the saw blade so the blade is just outside the “cut-line”. If the blade veers into the line, stop immediately and reposition the slab.

You may also turn the slab around and cut from the other side.

It is normal to see sparks where the blade meets the slab.

As you near the end of the cut, slow down to prevent the slab from breaking out, possibly in to your stone.



The more material that can be removed with the trim saw, the less time will be needed in the grinding process.

Step 3. Prepare Water Trays



- Place about one quart of water in each pan or enough to reach approximately two-thirds the way up the side of the geyser.
- Place the geysers in the water pan with the large hole down, and set towards the rear of the wheels.
- Make sure the air hose is not touching a wheel. It will cut right through it and disable the geyser.
- Remember to move the geyser from wheel to wheel as you work.
- If the spray is not strong enough to keep the wheel wet, add a little more water.
- If the geyser is plugged by a small piece of grit, use a needle or paper clip to remove the obstruction or try to blow it out.

Step 4. Adjust the Lamp

- Use both hands to adjust the lamp so you can grasp the base of the flexible stem and bend it from there in order to prevent excessive strain on the base attachment.

Step 5. Grind Pre-form to Size



The First and Second wheels are used to grind the stone to Size

- Using the First wheel (80/100), grind the pre-form to the approximate size of the template mark with only 1mm (1/32") of stone showing.
- Always use a water spray while grinding. Make sure to keep the wheel wet.
- Use the entire surface of the wheel as you grind. Avoid using just the center of the wheel as this will cause excessive wear
- Use a light to medium pressure during the grinding process.



Hold the stone with the template mark parallel to the wheel, as shown. Slowly turn the stone keeping the wheel parallel to the template mark. Never use a fast motion. Do not slide the stone from left to right. This will cause flat spots.

Stop grinding when you are almost to the template mark (thickness of a piece of paper).



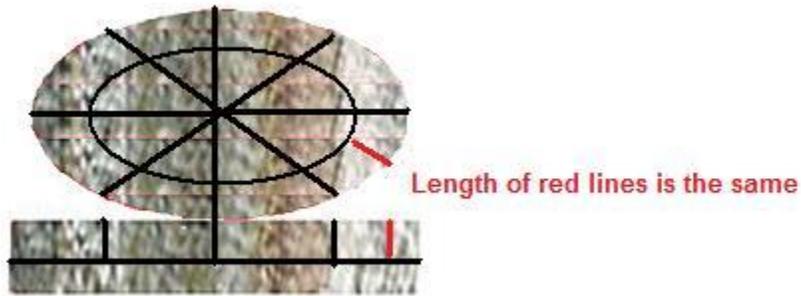
It should look like the picture.

Proceed to the Second wheel (220/400), making certain that you move the geyser to the wheel. Again, a very light to medium pressure is all that is necessary.

Finish grinding to the template mark. At this point, your stone should fit tightly into the template or setting. (A little more will be removed during the sanding process)

It's time to mark the girdle line and dop your stone

6. Mark Girdle Line and, optional, Orientation Marks



The Girdle Line is a mark around the stone the height of the setting you will be using. It is also the point where the dome rounding process begins and ends. In class, the girdle height we use is 2mm.

For stones that will not be placed in settings use the minimum height, 1mm. Stones should never be ground to a sharp edge.

Orientation Marks

This is a procedure Maggie developed to help beginners understand the doming process.

Use a Sharpie to mark the girdle.

Measure the height of the girdle and apply that same distance (red line) from the top edge toward the center and mark it with a dot.

Do this in several places around the stone.

Connect the dots to make inner circle on the top of your stone.

7. Dop the Stone

Warning: This wax is hot and can burn you.



- Turn the Dop Pot ON when you arrive. Add more wax, if necessary. It takes about 20 minutes to heat up.
- Place the stone, bottom side down, on the dop pot to heat it.
- To prepare for dop stick, dip it into the wax to get a little on the stick. Now, press it against a metal surface to flatten the wax. This gives you more surface area to attach the stone.
- Add more wax to the stick, turn the stone over, and push the wax into the stone. The wax hardens quickly. You have about 30 seconds.
- Keep the stick straight up while you use your fingers to move the wax so it coats the entire surface of the stone.
- Use a knife to remove any wax on the girdle of the stone.
- If it is not dopped to your satisfaction, you can re-heat the wax with a butane lighter, match or candle. You will need to bring these items with you.

8. Grind the Dome Shape



The First and Second wheels are used to shape the Dome

Decide the dome height for your stone.

In class we teach everyone to cut a Medium Dome.

You can also cut a High Dome or Low Dome, depending on what you like best or is appropriate for your stone.

Also, the Titan comes with an attachment for making Low Dome stones.

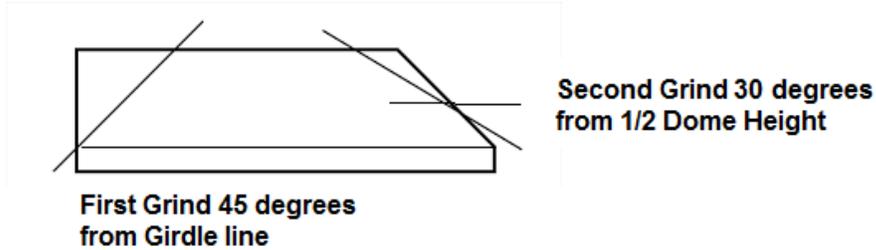
Choosing Dome Shape:

High Dome – Looks good on stones like Tiger Eye or Moonstone where you want to see a line travel as its rotated. Stone should be about 1/2 inch thick.

Medium Dome – The traditional cut for stones about 3/16 inch thick.

Low Dome – Used on thin, 1/4 inch, stones

Use this procedure for a Medium or High Dome



Place the geyser under the First wheel (80/100), and tilt the stone 45 degrees and grind around the stone until there is a straight line from the top line on the top of the girdle mark to the outside edge of the top circle.

Next, tilt the stone to 30 degrees and grind again. The circle on top will disappear but there will still be small lines emanating from the center.

Using the same wheel, round the dome by slowly moving the stone in a rocking motion across the flat area on top of the stone. Go from side to side and top to bottom until the stone is round on top.

When you are finished, dry the stone and examine it. The stone should be symmetrical with heavy scratches but no obvious flat spots.

Place the geyser under the Second wheel (220/400). With a Very Light touch barely touching the wheel, use the same rocking motion to remove the heavy scratches and any remaining flat spots or imperfections. If you don't use a Very Light touch, the flat spots not go away.

At this point, your stone should not have any heavy scratches or flat spots. You're ready for Sanding.

Use this procedure for a Low Dome

Start



End

First Grind 45 degrees - Second Grind 25 degrees - Third Grind 12 ½ degrees

This video shows how to cut a Low Dome
<https://www.youtube.com/watch?v=GwoRjUoNwls>

- Use the same procedure in Method 1 except make three grinds at 25 degrees, 25 degrees and 12 ½ degrees.
- If you prefer, you can just mark the girdle line and cut as shown in the above video.

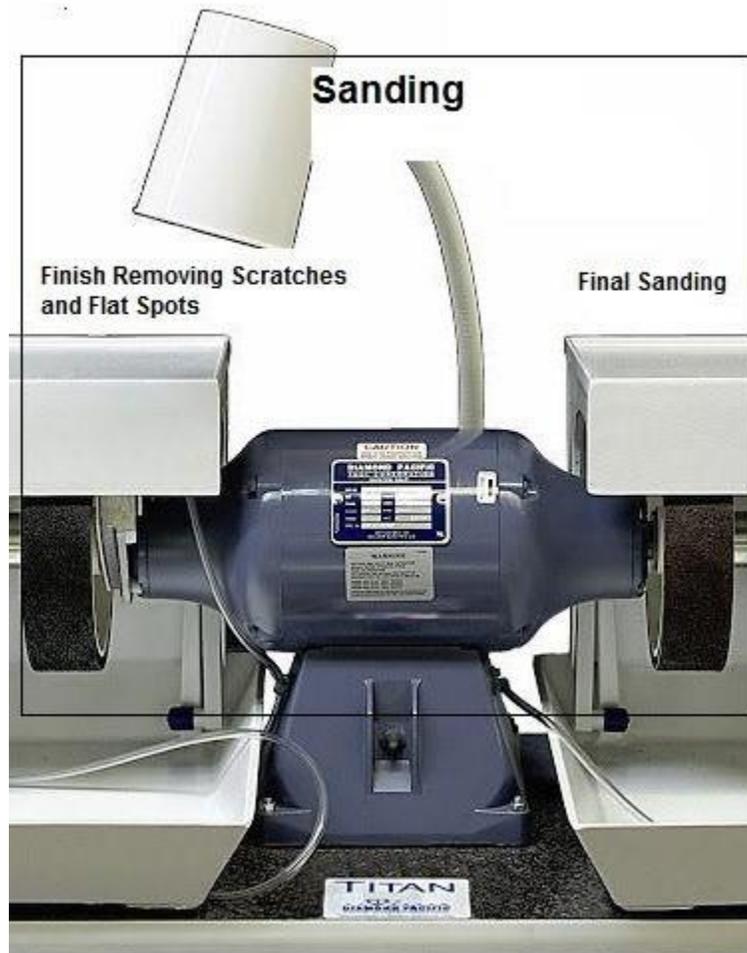
Use this procedure for a Low Dome when using the Titan Cab Rest

We have not used this tool yet. The information below is from the Titan Owners Manual.

- The odd shaped plastic cab rest has two main purposes, to act as a steady rest for the hands while grinding and polishing a stone, and to provide an easy, accurate way to grind the bezel on cabochons.
- The cab rest can be set in the pan in any position that enables you to steady your hands while grinding and polishing. Usually it will be laid flat in the pan.
- To grind a uniform bezel on your stones, set the cab rest upright, with the down slope towards you and the upper end close to the grinding wheel. Turn your cab topside down, place on top of cab rest, and proceed to grind the edge. The slope of the cab rest is at an angle that will give you a uniform 12-½ degree bezel.

Step 9. Sanding

The Third and Fourth wheels are used for Sanding



If these wheels are run dry for more than a few moments, rapid wear and damage can result.

Never use any Soft Wheel for more than two minutes. It will cause unnecessary wear.

Start with the Third wheel (280), making certain that the geyser is supplying water to that wheel.

Use a firm pressure, depressing the rubber backing so that it conforms to the surface of the cab, and keep moving your stone with a circular and oscillating motion at all times.

This firm pressure (in contrast to the light to medium pressure used on the grinding wheels) and the circular and oscillating motion are important procedures in eliminating flat spots and scratches.

Using too light a pressure, or allowing the stone to remain in one position, can result in more scratches and flat spots.

Only spend one or two minutes on the Third wheel (280) to completely sand away the scratches and flat spots left by the grinding wheels.

After a minute or two, dry the stone off and look at it under a light. It should be symmetrical with no scratches, flat spots or other imperfections.

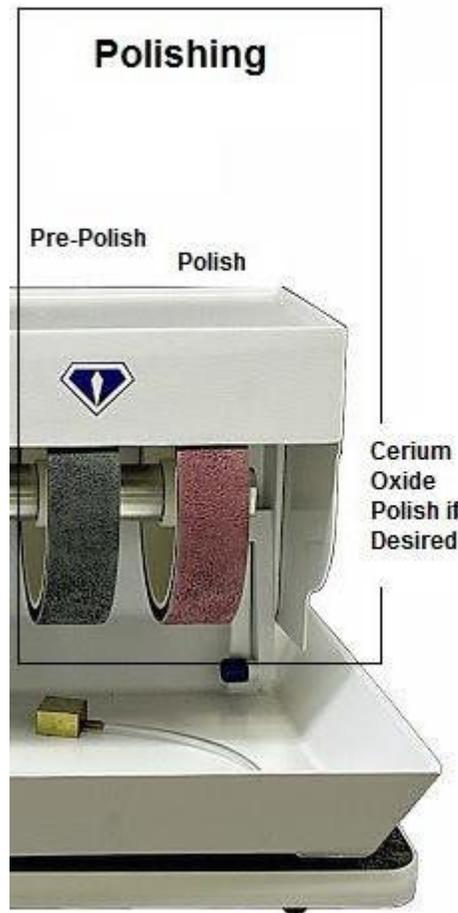
If any scratches, flat spots or imperfections are present, mark them with a Sharpie and go back to the second wheel to remove. Be sure to use ultra-Light pressure.

Flat spots, worm tracks, and other imperfections are caused by using too much pressure on the Second wheel.

Step 10. Polishing

The Fifth and Sixth wheels are used for Polishing

Along with the Polishing Pad, if needed



- Proceed to the Fourth wheel (600), making certain you move the geyser first.
- Use medium pressure to go over the entire stone in a circular and rotating motion.
- You should only need to spend a minute or two on each of the Fourth wheel (600), Fifth wheel (1200), and Sixth wheel (3000) to achieve a fine polish on your stone.

For those stones requiring an additional step to achieve a satisfactory polish, use the pad mounted on the end of the unit. Add a little water to the cerium oxide to make a paste. Brush a small amount on your stone and polish it on the pad. This is the only wheel that does not use the geysers

Again, use medium pressure for about two minutes. Do not push hard against the pad.

Troubleshooting

Make certain all deep scratches left by the 80/100 grinding wheel are removed by the 220/400 wheel.

Make certain you are using enough pressure on the resin-bond wheels. Too light a pressure can cause scratches.

What happens if I use a Soft wheel for more than 2 minutes?

These wheels are designed to do their job in two minutes. Using them longer will grind away the diamond powder. I may take you 20 minutes to remove a scratch that can be done in as little as 30 seconds on the previous wheel.

I have deep scratches or flat spots after using the Second wheel.

Probably caused by pressing too hard on the First wheel. Continue using the Second wheel with a light touch and continuous motion. If you stop you will get a flat spot.

I still have scratches or flat spots after using the Third wheel for 2 minutes.

Firm pressure is needed on this wheel. Light pressure may cause scratches. Do not continue on this wheel. Go back to the Second wheel and use a light touch and continuous motion to remove the scratches.

I still have scratches or flat spots after using the Fourth wheel for 2 minutes.

You should have seen the scratches after the Third wheel. Pay more attention when examining the stone. Go back to the Second wheel and start from there.

If I push harder on the Third wheel will the scratches or flat spots come out?

Probably, but you will cause serious damage to the wheel and take months off its life expectancy. Do the job correctly. Go back to the Second wheel, use a light touch and continuous motion to remove scratches and flat spots.

Step 11. Cleanup

- While machine is running, clean each with the scrub brush.
- Remove the hoods and cleaned the underside
- Empty the water trays into the bucket and discard outside over the wall.
- Wipe residue from the trays using paper towels or rags
- Clean the counters and put everything away.
- Turn OFF the Dop Pot.
- If you used the Old Grinder, turn OFF the main water supply and empty the bucket.