

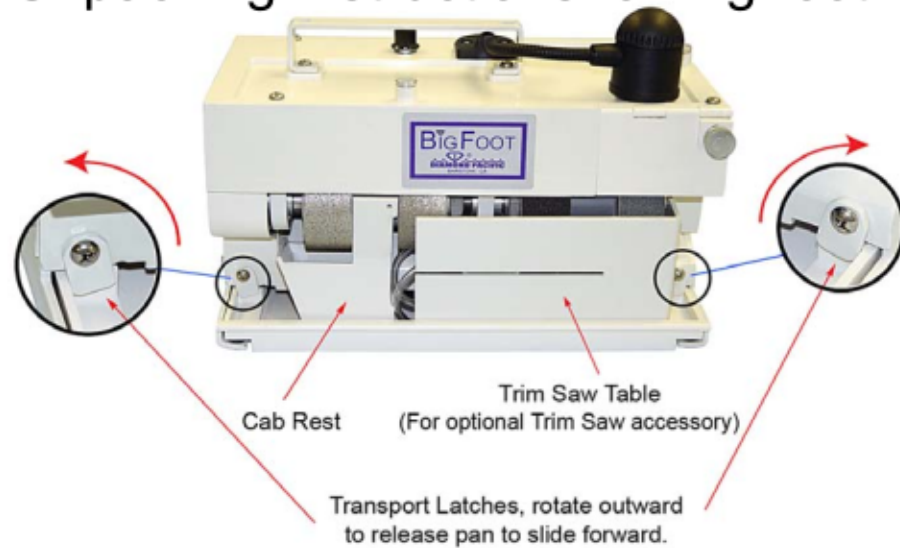
BigFoot Manual

BigFoot

500-BF-100



Unpacking Instructions for BigFoot



1. Remove machine from carton and set on a level surface.

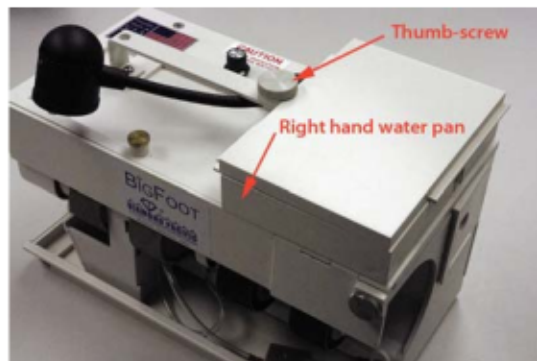
2. Rotate Transport latches (pictured above) outward and pull pan toward you until it stops.

3. Remove Cab Rest and other loose parts from pan.

4. Remove electrical cord from cord storage area on rear of unit.



5. Loosen thumb-screw on top of machine to remove the right hand water pan and its cover.



6. Please read safety instructions and entire operating instructions in the manual before using machine.

Important Safety Instructions

Please Read Before Operating This Machine

✓ Before plugging in this machine, make certain the electrical outlet is properly grounded and of the proper voltage. Also make certain that the machine switch is off and that your hands and the electrical connections are dry in order to avoid possible electrical shock.

✓ **Do not** use silicon carbide or aluminum oxide wheels on this unit. Such wheels require metal guards as they may break and fly apart while in use. The hood and pan on this unit are designed for use with diamond grinding wheels only, and **should not be used** with silicon carbide or aluminum oxide wheels.

✓ Rock dust can be hazardous to one's health. Use sufficient water at all times while grinding and polishing stones so that rock dust does not form.

✓ Before grinding and polishing any material, make certain that it will not produce toxic fumes or dust. Sea shells are one of the known hazardous materials of this type. If you should ever have occasion to grind metallic ores or other mineral specimens, 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 from flakes of stone or other objects that might be thrown by the wheels.

✓ It is possible for a stone to become wedged between adjacent wheels or between wheels and the pan which could result in injury to yourself and/or damage to the machine, such as a bent shaft. Be alert while working to prevent this from occurring.

Introduction

BigFoot is a very compact cabochon grinding and polishing unit complete with motor, diamond wheels, and coolant system. It requires no attachment or hookups other than a standard 115 volt electrical outlet, making it portable and light weight. Since the grinding and polishing wheels do not require large amounts of water, this ultra-portable unit is also a clean operating unit, and can be used almost anywhere: In RV's, schools, kitchens or motel rooms. Placing small cloth or paper towels under your unit will make clean-up a snap.

BigFoot comes with two Galaxy metal-bond diamond grinding wheels: one 80 grit for coarse grinding, and one 220 grit for fine grinding. The set of four Nova 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 those stones that may benefit from an additional polishing step, a canvas pad is included for use with finer grit diamond compound, and can be attached to the right hand shaft. With four wheels mounted at once and the remaining two on a quick-change adaptor, the lapidary can quickly and efficiently grind and polish most stones in a matter of minutes.

Flex Stem Lamp

The halogen lamp may be switched on by turning the lamp head so that the two white lines are lined up, avoid turning to the position indicated by two small triangles as this is done only when disassembling the lamp to change the bulb.



Motor

The BigFoot motor is a heavy-duty, industrially rated, sealed motor made especially for Diamond Pacific Tool Corp. It is unconditionally guaranteed by the manufacturer against defects in workmanship or components for one year from date of purchase.



Both on/off and speed control functions are controlled by the knob located on the top of the unit.

Since the motor is totally enclosed to prevent grit contamination of the bearings, it never needs oiling.

BigFoot can be operated with any small generator producing 110 volts A.C. With a generator, you can use your BigFoot out in the field as well as in your home or shop.

Housing and Pan

BigFoot is built on a heavy 1/8" thick welded aluminum chassis that has been powder coated for lasting good looks. The pan and the case that covers much of the chassis are molded of rigid plastic that is durable, lightweight and easy to clean. A ridge around the top edge of the unit makes it a convenient tray for stones.

Cab Rest

The odd shaped aluminum cab rest can be used 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 12-1/2 degree bezel. Do not use the cab rest with Nova wheels.

Storage Compartments

Power Cord:

The power cord can be stowed inside its "doghouse" by turning the machine face down and putting the cord end inside first. Next feed the cord inside by laying it back and forth, left and right, inside it's compartment. When there is only a small loop left, tuck the loop inside where it will be held in place by pressure from the cord within.

Pan:

The water pan can be used to store the following items beneath the wheels: Templates, cab rest, trim saw attachment with the blade laying flat in the pan and the blade adaptor placed behind the saw table. (See photo on page 1 to see how the cab rest and saw table are positioned). With the above items in place the pan can be pushed in all the way and

the small locks at the ends of the machine can be rotated down to hold the pan in place (templates and trim saw attachment sold separately).

Nova Wheel Compartment:

The “spare” Nova wheels can be kept in a compartment behind the small door on the right end of the machine. Pull up on the spring loaded latch to unlock this door.



Small Parts Tray:



There is another spring loaded latch at the front center of the machine. By pulling up on the knob you can pull open a tray that is located above the wheels. This tray can be used to store stones and dop sticks.

Spra-Mist Cooling System

Description:

The Spra-Mist coolant system utilizes a piston type air pump to operate the geyser that provides a fine mist to the underside of the grinding and polishing wheels. The pump may be seen through the two round holes in the back cover of the machine. Air from the pump is supplied through plastic tubing to the geyser.

The Spra-Mist pump is relatively trouble free because of its unique design. No water flows through the pump itself, so it cannot be damaged or clogged by rock dust or grit. Regular oiling of the leathers and bearings will generally keep the pump operating at maximum efficiency.

Operation:

1. The pump automatically begins to operate when the motor is turned on.
2. The geyser should be placed in the water pan with the large hole down, and set towards the rear of the wheels to avoid excess water splash. **Remember to move the geyser from wheel to wheel as you work.**
3. About one cup of water should be placed in the pan, or enough to reach approximately one third the way up the side of the geyser.
4. Occasionally a geyser will become plugged from the mineral content in the water. This usually can be corrected by boiling the geyser in a solution of vinegar and water. Or if plugged by a small piece of grit, use a needle or paper clip to remove the obstruction.
5. A few drops of Water Aid in the pan will improve the cutting ability of the Galaxy metal-bond diamond grinding wheels. Avoid excess Water Aid as it can cause excessive foam in the pan.

Pump Maintenance

Oiling Pump Leathers and Bearings:

To maintain maximum output, the leathers and bearings in the pump should be lubricated about every forty hours of machine use. Use the following procedure:

1. **UNPLUG THE MACHINE.**
2. With the pan pushed back in storage position, rotate the machine so that the back of the unit is on the top.

3. To oil the leathers, remove the upper screw (see picture) that is painted red. Place one drop of 30 weight motor oil in the hole and replace the screw. This hole oils the leathers, and any excess oil will eventually come out the air outlet tubing and into the water pan.
4. To oil the bearings, remove the lower screw that is painted red (see picture) Place one drop of 30 weight motor oil in the screw hole. Do not use too much oil or allow it to run out of the hole, as excess oil can leak onto the pump belt and cause belt slippage. Replace the screw.
5. Regularly oiling as explained above will normally keep the pump operating properly, but the two usual causes of decreased air output, dried out pump leathers and belt slippage, are easily corrected.



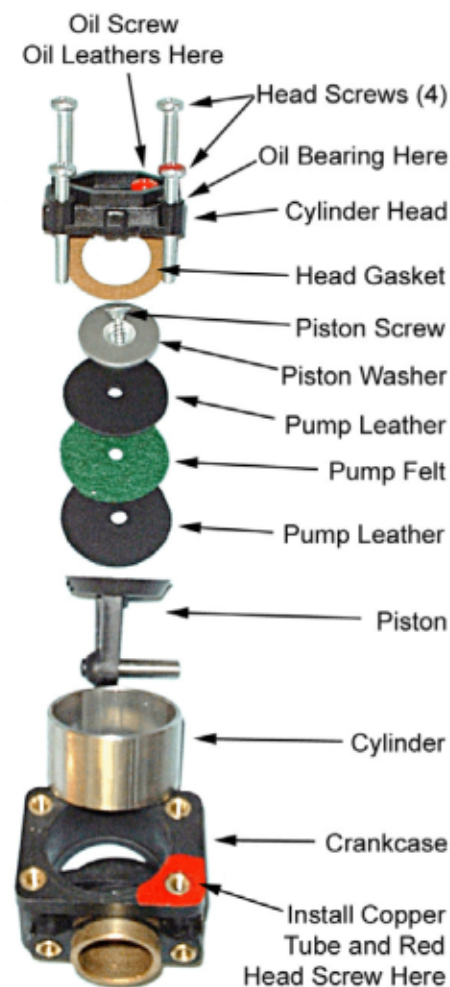
Dried Out Pump Leathers:

Decreased air flow with the pump still operating is usually caused by dried out pump leathers. The leathers should be removed and thoroughly oiled, or replaced. This can be done by disassembling the pump with a phillips screwdriver as follows:

1. **UNPLUG THE MACHINE.**
2. With the rear cover removed, remove the four corner screws on the top of the air pump. One is painted red and the other three are unpainted. Once the screws are out, remove the cylinder head and cylinder. The piston will then be exposed.
3. Remove the leathers and felt from the piston by unscrewing the screw in the top of the piston. Stretch the leathers and felt with the fingers, and oil them generously with 30 weight oil.
4. When ready to reassemble the piston, it is important that it be done in the following order: (see picture on following page)
 - A. Place the felt between the two leathers. The smooth or shiny side of the leathers should be away from the felt.
 - B. Place the piston washer on top of the leathers, countersink side

of the washer hole facing up. Center the washer so that the edge of the leathers shows evenly around it.

- C. Slip the screw through the washer and leathers and into the hole of piston top. Tighten the screw securely so that it cannot loosen.
- D. Slip cylinder and head back over the piston with the air outlet tubing to rear of machine
- E. Start the red screw back into the front left hole, then start the other three corner screws before tightening all four evenly and securely. Avoid excessive tightening of these screws as this may distort the main bearing of the pump, causing hard turning and overheating.



Belt Slippage:

Intermittent air output or no air output is caused by a slipping belt. This problem indicates that excess oil from the pump has leaked onto the pulley and belt, and can be corrected by cleaning and tightening (or replacing) the belt as follows:

1. **UNPLUG THE MACHINE.**
2. When the left end cover plate is removed, the pump pulley will be exposed. Rotate the pump pulley by hand until the two holes in the pulley are in a horizontal position and you can see two phillips head pump mounting screws in the pump base behind the pulley. Line up one of the holes with one of the screws and loosen the screw with a phillips screwdriver. Do not remove the screw. Then line up the other hole in the pulley with the other screw and loosen it slightly.

3. The pump will now slide in or out and the belt can be removed for inspection. Remove all oil from the belt and pulley grooves. Replace the belt, making certain it fits in the grooves in both the pump and shaft pulleys.
4. The belt can be tightened by pulling on the pump. When the belt is taut tighten the two screws behind the pulley. When the belt is the proper tautness, you will be able to depress it slightly. If it is too tight, the motor may not start or may run slow. If this happens, simply lower the pump base a little using the same procedure.
5. Replace the cover plate.

Procedure for Changing Wheels on BigFoot

1. **UNPLUG THE MACHINE.**
2. Hold the left hand wheels with your left hand, and turn the right hand wheels **in the same direction they spin while running.** The wheels will come off in a unit on the right hand adaptor.
3. Slide the second adaptor over the shaft. Hold the left hand wheels and spin the right hand unit of wheels onto the shaft until the adaptor is tight. **Hand tighten only.**

To Replace Wheels on Adaptor

1. Use an adjustable wrench to remove the nut on the adaptor. (This nut has left hand threads.) Once the nut is removed, the wheels and spacers will slide off the adaptor.
2. Clean the adaptor with fine sand paper, and oil with a very small amount of light weight oil.
3. Replace wheels and spacers on the adaptor, replace the nut, and tighten. Slide the adaptor over the shaft. Hold the left hand wheels and spin the right hand unit of wheels onto the shaft until the adaptor is tight. **Hand tighten only.**

Galaxy Metal Bond Diamond Grinding Wheels

Description:

Galaxy metal-bond diamond grinding wheels are designed to provide the gem-cutter with a smooth, fast cutting, true-running grinding surface ideal for working stones. The diamonds in a Galaxy Wheel are held on a heavy steel ring by an extremely hard nickel alloy plating. The ring is mounted on a tough, glass-filled polyester core, making a smooth, quiet running wheel.

Use and Maintenance:

Galaxy Wheels never need dressing. **Do not** attempt to do so as you may damage or ruin the wheel.

For longer wheel life and to prevent wheel damage, the following practices should be followed when using your Galaxy Wheels:

1. Use a light to medium pressure when grinding stones. Although diamonds are extremely hard, they are also quite brittle and can be easily shattered by excessive pressure or the bumping of a heavy rock. The wheels cut most effectively with a light to medium pressure and will last longer as well.
2. Use a steady rest to avoid uneven wear patterns. Steadying your hand while grinding will help prevent bumping and chattering that causes uneven wear of wheels. It will also help prevent damage to stones.
3. Use a coolant while grinding. Water is best and a small amount will normally do to keep the wheels wet. This prevents the formation of rock dust, keeps your stone cool, and stops the buildup of rock residue on the wheel surface which can slow down cutting action. When grinding soft materials such as onyx or turquoise, more water is needed in order to keep the wheel clean.
4. Use the entire surface of the wheel as you grind your stone. Avoid using just the center or edge or any one area of the wheel surface as this will cause excessive wear in that area and shorten the effective life of the wheel. When grinding crosses, hearts, fire agate, etc. be certain you grind with the diamond covered surface,

not on the bare metal side of the wheel, as this will undermine the diamonds and cause excessive wear of the wheel edge.

5. A few drops of Water Aid in the pan will improve the cutting ability of the Galaxy Wheels.
6. Reverse the wheels occasionally so that the diamonds cut from the opposite direction. The edges of the diamonds will wear with use, and the cutting speed will decrease. By reversing the wheel, the cutting edges of the diamonds are renewed.

Nova Resin-Bond Diamond Sanding and Polishing Wheels

Description:

Nova Wheels are specially designed to produce an excellent finish on stones with a minimum of time and effort. The diamonds in Novas are embedded within a tough, flexible, plastic resin backed by an extra soft, thick, sponge rubber backing. This soft, flexible construction enables the surface of the Nova Wheel to conform to the stone, eliminating flat spots and scratches.

Use and Maintenance:

1. Nova wheels **must** be used with a water lubricant. This fact cannot be stressed too strongly, for if the wheels are run dry for more than a few moments, rapid wear and damage can result. Make certain that the geyser is supplying sufficient water to the Nova Wheel before using it, and remember to move the geyser to the next wheel as you progress through the sanding and polishing procedure.
2. Nova Wheels should be broken in by sanding and polishing a large agate cab prior to working on others. This is necessary in order to remove excess resin coating surfaces of the diamonds. Spend from two to five minutes on each wheel with the first cab, working it over the entire surface of the wheel. The finer grit wheels, especially the 3000 grit, will take longer to remove the excess resin, and will continue to improve in speed and finish as more stones are worked.
3. Use sufficient pressure to cause the surface of the wheel to depress slightly to conform to your stone. This eliminates the flat

spots left by the grinding wheels and will cause fewer scratches than would be produced by pressure that is too light.

4. It is important to hold your stone so that you do not allow the upper or leading edge to act as a plow and dislodge diamonds from the surface of the wheel. The diamonds in Nova Wheels are firmly embedded in the resin and with proper use cannot be dislodged to cause contamination in proceeding from one wheel to the next. But they can be dislodged with the sharp edge of a stone.
5. To prolong the life of your Nova Wheels, be certain to prepare your stone properly on the grinding wheels prior to sanding. Use the metal bond wheels to grind your stone to its final size and shape, and to remove all sharp edges and corners. This leaves only the final sanding and polishing to the Nova Wheels. Similarly, it is important to do a good job of sanding at each stage before going to the next as the finer grit wheels will take much longer to remove scratches than do the coarser wheels.
6. If your stone still has scratches after the final polish, check the following procedures:
 - A. Make certain all deep scratches left by the coarse (80 grit) grinding wheel are removed by the fine (220 grit) grinding wheel.
 - B. Make certain you are using enough pressure on the Nova Wheels. Too light a pressure can cause scratches.
 - C. Make certain your Nova Wheels have been broken in properly, especially the 3000 grit wheel. If any one wheel seems to be causing the scratching, take a large agate cab and work it across the entire surface of the wheel.
 - D. Almost all problems with scratches are caused by improper procedure in the above three areas.

Procedure for Grinding and Polishing Cabochons

Pre-Forming – Preparing Stone for Grinding Wheels:

Since most gem material comes in sizes and shapes larger than desired for a single cabochon, it must be pre-formed. This is usually done by cutting the rock into slabs about 1/4 inch thick with a lapidary or rock saw. The best areas of the slab are then selected and marked with a template for shape and size of desired stones. Excess material is removed with a trim saw or one of the other tools available for this purpose. The more material that can be removed from a pre-formed stone at this step, reducing it to as near its finished size as possible, the less time will be taken in the grinding process. Just as important, the life of the grinding wheels will be increased.

Grinding on the Galaxy Grinding Wheels:

The basic procedure is to grind your stone to proper size and shape on the Galaxy Grinding Wheels. If the stone is properly prepared on the grinding wheels, it is only a matter of minutes more to polish it on the Nova Polishing Wheels.

First grind your cabochon to the approximate size of the template outline using the left hand or coarse (80 grit) Galaxy Wheel. Use light to medium pressure and work the stone over the entire surface of the wheel. Check the stones size as you work, either with the template or the mounting in which it will be set. Leave a small amount of material outside the outline so that the stone is slightly larger than the template or mounting. The balance of the excess material will be removed in fine grinding and some in the sanding process. Using the Cab Rest during the above procedure will make it easy to grind a uniform 12-½ degree bezel angle all around your stone.

Proceed to the fine (220 grit) Galaxy Wheel, making certain that you move the geyser to the wheel you are using. Again, a light to medium pressure is all that is necessary. Finish grinding the bezel of the stone, leaving only a small amount of material that makes the stone just a fraction too large.

Now move back to the coarse grinding wheel to grind the face or dome of the cab to shape. For best results, the stone should be dopped to enable you to hold it more easily.

Grind from the edge towards the center of the stone, and then back to the edge using a circular and oscillating motion as you work. The circular component of this motion is accomplished by continually rotating the base of the dop stick using your right hand. At the same time, your left hand is used to move the stone back and forth in an oscillatory manner so that its point of contact with the wheel spirals from the edge of the stone to the center and back without stopping, since stopping produces a flat spot.

This circular, oscillating motion is the key to well shaped stones and the prevention of flat spots. Check the curvature of your stone frequently to achieve symmetry. The outline should form a smooth arc when viewed in any direction, with no high spots or flats, especially at the top of the dome.

Once you have achieved a uniform shape, move to the finer grit wheel and remove all the scratches left by the coarse wheel. It is important to remove all scratches possible before proceeding to the Nova Wheels.

Sanding and Polishing with the Nova Wheels:

Before using any Nova Wheel, make certain that the geyser is supplying water to that wheel. **NOVA WHEELS MUST NOT BE USED DRY.**

1. Start with the 280 grit Nova Wheel, 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.
2. Spend enough time on the 280 grit Nova Wheel to completely sand away the scratches and facets left by the grinding wheels. This should only take a minute or two, leaving the stone with a uniform finish over its entire surface and reduced to very near its final size.
3. Proceed to the 600 grit Nova Wheel, making certain that you move the geyser first. Continue using firm pressure and the circular and

oscillating motion. You should only need to spend a minute or two on each of the 600, 1200, and 3000 grit Nova Wheels to achieve a fine polish on your stone.

4. It is important to do as good a job of sanding and polishing as possible at each stage before going on to the next, as the finer grit wheels take longer to remove scratches than do the coarser grit wheels
5. Some hard to polish materials, such as Jade, may require a finer grit polish than the 3000 grit Nova Wheel. A 14,000 grit Nova Disc is provided with the machine and will generally give an excellent polish. Other polishes such as cerium and tin oxide can also be used with untreated canvas or leather pads to provide the final polish.

Using Four Inch Diameter Attachments:

The flap at the upper right corner of your machine can be opened by first unscrewing the thumb-screw that holds it in place and then pulling the flap towards you. Do not open more than necessary as this will release a small spring and washer that you will have to put back in place.

When the flap is open it makes room for four inch diameter accessories such as Nova Discs, canvas or felt pads, or a four inch trim saw blade.

When closing the flap it is easiest to push the flap closed first and then tighten the thumb-screw.

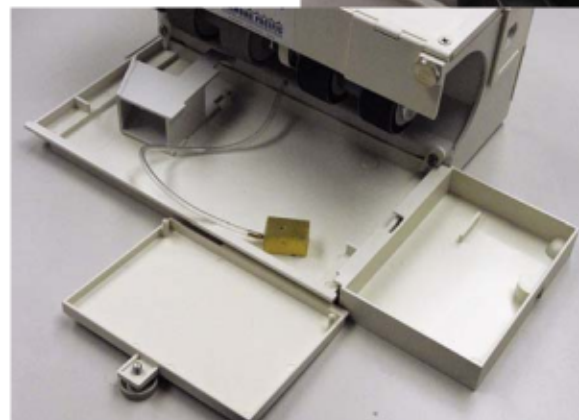
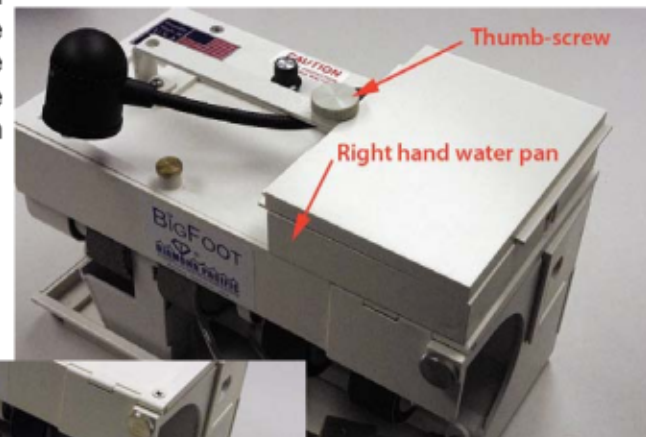


Using Nova Discs:

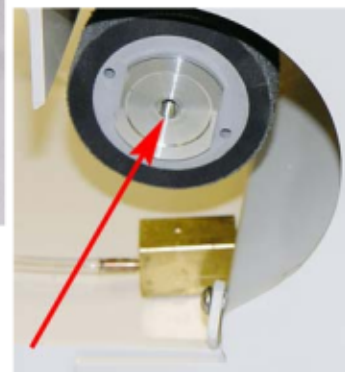
For those stones requiring an additional step to achieve a satisfactory polish (jade and some soft stones, for instance), we recommend using the Nova Disc that comes with the machine. Other types of fine polishing compound such as cerium and tin oxides also produce excellent results, and untreated canvas, felt and leather pads are available for use with these compounds.

1. Loosen the thumb-screw atop BigFoot to remove the right hand

water pan and its cover. Place this pan along the right side of BigFoot and add water. The cover can be placed where needed to catch overspray.



2. Thread the Nova Disc into the 1/4-20 mounting hole in the right end of the machine.



3. Snap the small, white plastic, geyser base that came with your machine onto the bottom of the brass geyser to angle it to spray on the Nova Disc. **NOVA DISCS MUST NOT BE USED DRY.**

4. When you are through using the Nova Disc it can be stored inside the right hand water pan on top of BigFoot.

Changing Galaxy wheels or bearings on the Big Foot



1. Remove the right hand adaptor together with its two wheels and the aluminum spacer behind it..

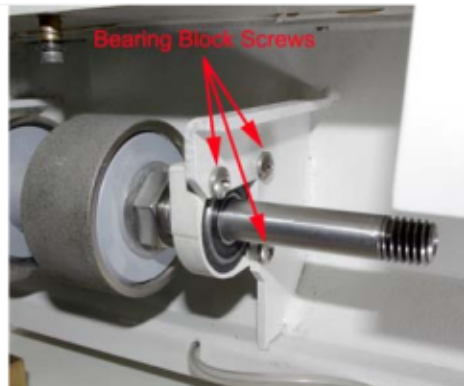
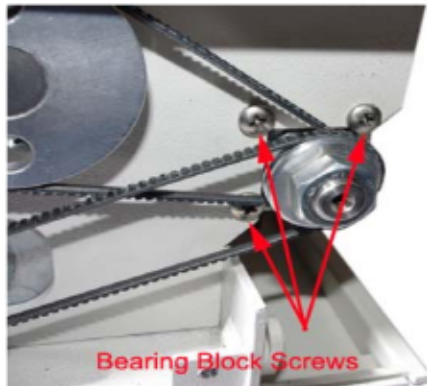


2. Remove the small parts tray by lifting the brass knob and pulling the tray out.

3. Remove the two screws on the left end of the machine and remove the belt guard by pulling out on the bottom of it and then down.



4. Use a phillips head screwdriver to remove the six screws that hold the bearing blocks in place (three screws in each block).



5. Lower the right end of the shaft and remove the two belts from the pulley on the left end of the shaft.

6. The shaft together with the bearing blocks and Galaxy wheels can now



be removed from the machine.



7. Remove the right hand bearing block with its bearing.

8. Remove the aluminum spacer ring.

9. Remove the right hand retaining nut and washer.

10. The Galaxy wheels can now be replaced.



11. If the bearings are to be replaced it is necessary to remove the nut on the left end of the shaft (it has left hand threads). The pulley and left hand bearing block can now be removed.



12. The old bearings can now be pushed out of the bearing blocks.

13. To install new bearings it will be easiest if the rubber mounting ring is first placed about half way onto the bearing, then the bearing and rubber ring are pushed into place with the rubber ring entering the bearing block first.



14. When the bearing blocks are replaced on the shaft the blocks should be positioned with the larger hold side facing outwards.

15. Reverse the process to reinstall the shaft.

Optional Accessory

A **trim saw attachment** is available that can be mounted on the right hand side of the **BigFoot**. The saw comes with a four inch blade and uses water as a coolant, so that it can be used wherever your **BigFoot** is set up.



Quickly converts your **BigFoot** into a four inch trim saw.

Just spin off the right hand wheel adaptor with the wheels still attached and spin on the saw adaptor with blade. The whole process takes only a minute and changing back is just as easy!

Parts and Accessories

BigFoot Trim Saw Attachment	500-BFS-105
Replacement Trim Saw Blade	300-0401450-83
Water Aid, 8 oz bottle (call for other sizes)	410-WA-108
Replacement Brass Geyser	101-GSG-25
Pump Leathers (set)	101-GPL-145
Belt (2 used)	101-TPB-193

Orders/Technical Support:

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