



SINCE 1872

501XL Bench Top Pulverizer

Machine Manual

Installation, Operation, Maintenance

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Notice of suitability.

Holmes Bros. Technologies, LLC strives to build the most robust equipment that suits our customers. If at any time a piece of equipment isn't capable to meet the needs of the industry, we want to know about it and determine the correct course of action. Our goal is to be a partner with our customers and understand their processes and environments.

In today's global marketplace, there are many standards and acceptable practices. Our machines will operate in a variety of them. Unfortunately we won't be fluent in them all. Therefore, although we can recommend a machine that will work in a given application, we cannot guarantee the suitability of our machines beyond the designed function.

During the purchase of your machine from one of our distributors, you should have been asked to supply your input power and application. Please take special consideration at this time to make sure the equipment you received is suitable for your application before use. Verify that the machine is configured for your power supply and has the correct screen plates. Please inform us of any discrepancy so that we may discuss it with our distributor.

Welcome to the HBLLC family.

Thank you for choosing Holmes Bros. Technologies, LLC. If this is your first piece of Holmes equipment, we're pleased to be chosen as a supplier that can meet your needs. We know that in today's market the choices seem endless and it is hard to tell the difference between the real thing and the imitators. Since 1872, Holmes has survived the test of time by producing quality equipment for the mining and laboratory industry to be used in the harshest environments. The equipment has changed over time to stay competitive, but is built as durable today as ever. You will know our machines are the real thing when they are put to the test.

At Holmes Brothers Technologies, LLC, we're committed to working with you to understand your goals and how we can best assist you to meet them. In this packet is a Product Registration Card. Please take the time to fill out this card and return it to the address printed on the back. We enter this information and any other comments you may have into our database. This way, we can always know what equipment you have and maintain the history on it as time goes by. Many of our machines run for decades and we are happy to record the details so we can be ready to assist you. Please retain the information provided for replacement parts and maintenance or troubleshooting your equipment. In the event that you need us, our customer service group will be happy to answer any questions about our products. Please ask about our automatic maintenance reminder program.

Thank you again for choosing Holmes Brothers Technologies, LLC. Please contact your distributor for pricing and availability on any of our products or parts. If you have any requests or suggestions regarding our products, please send them to the address listed on the last page of this manual. We will give your opinions our sincere consideration. We realize that our continued success depends largely on your success. Thank you and best of luck.

Machine Installation

The 501XL has been designed to meet your needs with a minimum of installation work. However, due to the wide range of environments that our machines go into, here are a few tasks before turning on the machine.

1. Inspect the packaging and/or skid the machine arrived on for damage during transit. Photograph any signs of damage.
2. Remove the box/packaging and discard. The machine is held to the skid via screws. These can be removed easily with a screwdriver.
3. Place the machine on the bench where it will operate. Report any sign of damage immediately to your sales representative. Open the pulverizer door and turn the rotor by hand to make sure it spins. Remove the yellow hopper cover and visually inspect the auger to make sure there are no particles or debris that could jam the auger.
4. The machine is now ready to be wired.

Note: A qualified electrician should wire the machine to meet the electrical codes that govern your site. Holmes Bros. Technologies, LLC will not take responsibility for errors made during this step. A wiring diagram has been supplied as a guide only. Be sure that the machine wiring is consistent with the input power that you specified at the time of order.

5. Due to the wide range on international, regional, local, and intercompany wiring practices, the machine is supplied with only the power cord. Please refer to your specific regulations to safely wire the machine for your site.

Other considerations regarding this machine include the health, safety, and ergonomic requirements of the operator.

1. The machine should be placed in an environment that allows the operator fresh air free of suspended dust. The fresh air should flow from the operator to the machine.

2. The machine should be placed in an environment that is free of trip/fall hazards or wet conditions.
3. The machine should be placed so that the operator can work with the machine without excessive bending, reaching, or in tight spaces.
4. All regulations regarding appropriate PPE should be strictly adhered to.
5. Operators should be well trained on the proper use of the machine and the hazards present. This training should be documented and periodically updated.
6. The machine should be set and operated on a surface that is suitable to hold the weight and vibration of the machine.
7. The machine must be kept dry and not exposed to ambient temperatures above 100 °F.
8. The machine must be dusted off to prevent combustible layers from building that could potentially create a fire hazard.

Machine Operation

The 501XL is a simple machine to operate. It has a simple ON/OFF operation and reset feature in the event that the door is opened while running or thermal overloads trip. However, as with all machines there are other things to consider before operating.

1. The inside of the machine is free of paint in order to prevent ongoing contamination of samples. However, there is a light coating of rust preventative present. Initial samples will wear this coating off and leave a bare metal surface that will not affect your sample.
2. Refer to you lab policies on the number of discard samples that should be run before using the machine for test readings.

During operation.

1. Ensure that the pulverizer door is shut and latched.
2. Remove the hopper cover and pour the sample into the hopper.
3. Replace the hopper cover.
4. Start the machine by pressing the START button.
5. If the machine needs to be reset, press the STOP/RESET button firmly.
6. The machine will move the sample into the pulverizer chamber.
7. Once the sample sounds as though it is done, press the STOP button.
8. Remove the hopper cover and inspect to see if the sample has been moved into the pulverizer.
9. Open the pulverizer door to ensure that the sample has been pulverized.
10. If so, clean the pulverizer for the next sample run.

Basic Machine Maintenance

Maintenance frequency chart

Part	Description	Frequency (hrs of use)
30-3	Door Seal	2000
500-12	Auger Bushing	2000
500-69	Drive Belt	2000
501-4	Sample Container Gasket	2000
501XL-30	Rotor Shaft Seal	2000
501XL-61	Rotor Shaft Bearing	2000
501-18	Rotor	4000
500-9	Auger	6000
501XL-63	Rotor Shaft	6000

Congratulations on your purchase. The 501XL is a relatively maintenance free machine. All bearings are sealed for life and require no periodic lubrication. Perishable and wear parts are made from quality certified steels and coatings to provide long life. OEM parts are available through your distributor and are easy to replace using the correct tools. Below are some common tasks that can be performed by a novice mechanic using relatively few tools.

Note: All hazards and sources of energy must be neutralized before maintenance steps are performed.

Rotor removal and replacement.

1. Open the pulverizer door.
2. Remove the rotor retaining screw in the center of the rotor.
3. Loosen the set screw located on the side of the hub.
4. Fit the rotor puller inside the rotor and turn the jack screw into the center of the shaft to pull the rotor off the shaft.

Note: A liquid penetrant may be required if the rotor is seized onto the shaft. Removal should not require an excess of 10 in-lb on the screw.

5. Once the rotor is removed, check the shaft for marring and damage. Replace if necessary.
6. The new rotor should slip on the shaft against the shoulder in the rear.
7. Orientate the set screw to the flat on the side of the shaft and tighten.
8. Replace the rotor retaining screw and tighten.

Replace the screen plate.

1. Remove the rotor as per the instructions above.
2. Using a screwdriver if necessary, work the old screen plate out of the machine.
3. The new screen plate may require some trimming on the ends to get a perfect fit. This can be done with hand shears.
4. Fit the new screen to the inside of the pulverizer.
5. Ensure that there are no gaps around the drop through opening at the bottom of the pulverizer.
6. Ensure that the screen is securely held by the two pins at the top of the pulverizer and that no edges of the screen are hanging down.
7. Replace the rotor as per the instructions above.

Replace drive belt

1. Remove back covers from pulverizer to access belt.
2. Loosen motor plate screws and raise motor so that the belt is loose.
3. Remove belt and replace with new.

4. Lower motor height adjustment nuts so the motor hangs on the belt.
5. While keeping the motor shaft level, turn the motor plate nuts down until the belt is snug.
6. Rotate the nuts under the motor plate up against the bottom of the plate and tighten.
7. The belt should still be snug and motor shaft must be level. The motor shaft out of level will cause premature belt wear.
8. Rotate the rotor by hand to make sure the belt is tracking properly.
9. Replace the guards and operate the machine.
10. If the belt slips while pulverizing, repeat the tightening sequence.

Note: The belt will stretch and loosen up after it gets warm and over time. Periodic adjustments may be required.

The 501XL is designed to operate for many years. The bulk of the castings and structure allow for several rebuilds and updates. Therefore, over time you will come across more detailed maintenance tasks in order to keep your machine operating at peak efficiency. The following are some of the more detailed items.

Note: These tasks are for skilled mechanics and will require a larger number of tools.

Replace seals

1. Remove old seals and scrape old glue from surfaces. Sand the area to remove small pieces and debris.
2. Clean the surfaces with an evaporating cleaner such as window cleaner.
3. Apply the new glue to the seal and also to the surface.
4. Mate the seal to the surface and press firmly to squeeze glue across the entire surface. This will create a better bond.
5. For the sample container seal, put the sample container in upside down to maintain pressure against the seal.
6. For the door gasket, shut the door and latch it.
7. Allow the seal to sit undisturbed for 3-4 hours.

Bearing replacement – an arbor press is recommended.

1. Remove the rotor and driven pulley from the rotor shaft. The guards covering the belt will need removed as well.
2. Remove the rotor shaft housing from the pulverizer casting.
3. Remove the two outboard snap rings from the rotor shaft.
4. Screw the rotor retaining bolt completely into the shaft. This will be the surface you will use to drive the shaft out.
5. Support the small end of the housing and drive the bottom bearing out.
6. Remove the screw and slide the shaft out of the housing.
7. Drive the bearing off the shaft.
8. Turn the housing over and drive the remaining bearing out of the housing.
9. Install the new bearing in the housing first.
10. Insert the shaft and replace the snap ring.
11. Turn the housing over and insert the second bearing.
12. Replace the last snap ring.
13. Assemble machine.

Rotor shaft seal replacement

1. Remove the rotor housing.
2. Drive out the two seals.
3. Clean any debris or contamination from the bore.
4. Drive the new seals in using a seal driver and mallet.
5. The inner seal should sit flush with the inside of the pulverizer.

Auger and auger bushing removal.

1. Remove the auger guard.
2. Unclip the auger chain and loosen the set screw on the driven auger sprocket to remove it.
3. Loosen the set screw on the side of the hopper and remove the auger and bushing.
4. Assemble in reverse order.

Troubleshooting

1. Machine does not run.
 - a. Verify that incoming power is on and correct.
 - b. Verify that door is closed and latched.
 - c. Verify that thermal overloads are not tripped.
 - d. Verify that the door proximity switch is working.
2. Machine will not reset.
 - a. Verify that incoming power is on and correct.
 - b. Verify that door is closed and latched.
 - c. Verify that thermal overloads are not tripped.
 - d. Verify that the door proximity switch is working.
 - e. Verify that STOP/RESET switch is touching the internal buttons.
3. Machine is louder than when new.
 - a. Guards may come loose and are shaking.
 - b. The rotor bearings may need replaced.
 - c. The belt may need replaced.
4. The motors are hot when machine is running.
 - a. Verify that incoming power is correct.
 - b. Replace the starter.
5. The machine has a violent vibration.
 - a. The rotor shaft or rotor may be bent and out of balance.
 - b. The belt may need replaced.
6. The rotor doesn't turn when the machine is on.
 - a. The rotor motor thermal overload is tripped.
 - b. The rotor motor brushes are bad.
 - c. The rotor motor is bad.
7. The machine doesn't auger the product into the pulverizer.
 - a. The auger may need to be removed and cleaned.
 - b. The gearbox on the motor is broken.
 - c. The auger motor thermal overload is tripped.



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