Castle System Drill

Model LB-23

Operator Manual

Castle, Inc.
Petaluma, CA
800-282-8338

U.S. Patent No.
5,676,498

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DO NOT OPERATE THIS MACHINE UNTIL YOU HAVE READ THIS MANUAL COMPLETELY.

Safety Notification

***WARNING*: The Castle Model LB-23 System Drill was designed with operator safety as a priority. This machine was carefully prepared for shipment at our factory. Upon receipt of this machine, inspect for shipping damage. Report any damage immediately to the freight company, your Castle dealer and to Castle, Inc. DO NOT attempt to operate this machine if you observe any physical damage. Contact Castle, Inc. at 800-282-8338 for instructions.**

INVENTORY

With your Castle machine you should have received the following:

- **Warranty Card (Please fill out & mail to Castle, Inc. to activate warranty)**
- **LB-23 Operator Manual**
- **One bottle LB Oil**
- **One 3/32 T-Handle Allen Wrench**
- **Left and Right Side Stop Assemblies**

MACHINE REQUIREMENTS

Electricity: 110V

Air Supply: 80 PSI minimum, 150 PSI maximum

Setting Up Your LB-23

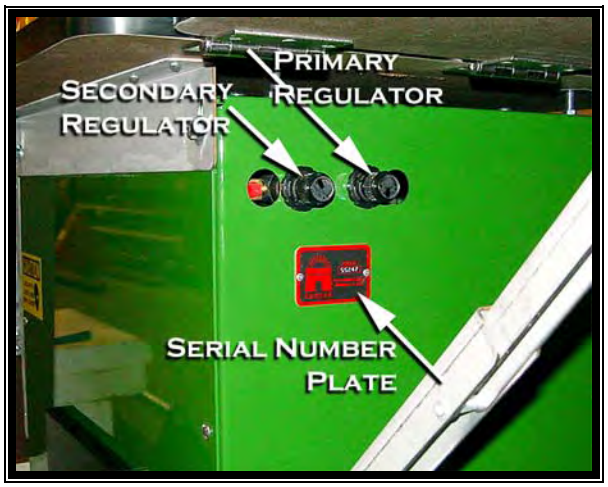
Your Castle LB-23 system drill was set up and tested for proper operation at the factory. It is normal to find a small amount of sawdust residue in the machine from this process.

- Begin set-up by unwrapping and installing the side stop extensions for your machine. On either side of the yellow guard you will find two hex head bolts with T-nuts. Loosen these bolts and slide the side stops on.

- The yellow stop on the side-stop should point to the drill bits.

- Tighten the hex heads.

- Next, hook up the air to the machine. On the right side of the machine you will find two regulators and two brass fittings.



- The brass fitting towards the rear is the air inlet. You will want to attach air to the machine at this inlet. ***Caution: do not over tighten coupler to fitting.***

- The fitting towards the front comes with a plug in it; if you want to attach an air tool to the machine you can use this port.
- For optimal performance of your LB-23 plug your motor directly into the wall. The use of an extension cord and/or having the machine at the end of a circuit may impede the performance of the machine.

- With the air hooked up to your machine and the power turned off, position the foot pedal in such a way it is comfortable for the operator. Take a few minutes to get familiar with how it operates.

- Pressing halfway down on the pedal will bring the index pins down and full depression will bring the head down.

- Next, cycle the machine with the motor on and the stock in place.

Operating Instructions

Always use eye protection when operating power equipment.

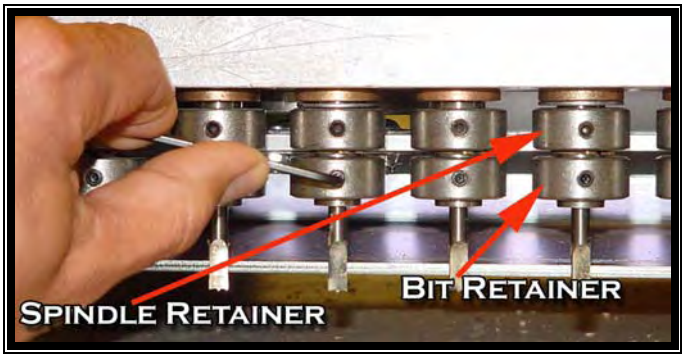
- Turn on the motor at the switch mounted on the motor facing the front of the machine.
- The foot pedal operates in two stages. Pressing down halfway brings the index pins down. Full depression of the pedal brings down the head to begin boring.
- If you are drilling an upper, the two drop gauges with handles on the right should be down.
- Push your board up against the first drop gauge and side stop and then press the foot pedal down to begin the cut.
- To end the cycle, release the foot pedal.
- Next, push the first drop gauge up and slide the board back against the second drop gauge. Remember to keep the board pressed against the side stop. Cycle the machine. Release the foot pedal and the upper is completed.
- To do a lower, leave the second drop gauge up and follow the same process as the upper.

Machine Adjustments

The Castle model LB-23 is designed for use in a wide variety of materials. You will find that the machine performs well in hardwoods, softwoods, melamine, particleboard and MDF. The machine will work on materials of thickness from ½" to 1 ¾".

Collet Adjustment

- There are two collets per spindle, making 46 collets per head. The collet on the bottom of the spindle is used to lock the drill bit into the spindle assembly.



- The upper collet is used to hold the entire assembly to the head.

- To get the best results the upper shaft collar should be pushed as close to the snap ring as possible, and then tightened.

Cycle Time Adjustment

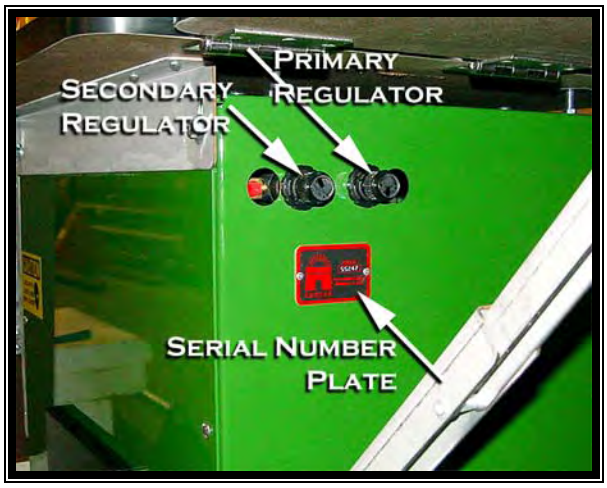
Two adjustments control the amount of time that the cutting cycle takes to complete:

- The air pressure to the head is set at the primary regulator closest to the rear of the machine.

- The first valve activated in the foot switch is supplied with air from the secondary regulator, which is the one closest to the front of the machine. This, in turn, supplies air to the index pins.

- The primary regulator should be set at 80 to 85 PSI.

- Setting internal pressure for the head can be achieved by turning the primary regulator counter-clockwise until the knob stops.



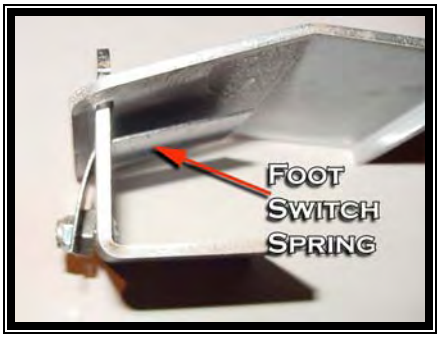
- Next, mark the knob of the regulator so that you have a reference point to start from.

- Using the reference point you just drew, turn the regulator 5 ½ to 6 ½ turns to reach a sufficient air pressure. (Approximately 80 to 85 PSI)

- The foot switch can also effect the cycle time of the machine. The valve should be fully closed when the pedal is not depressed. If the valve is left partially open then the pressure to the air bladder will need longer to build up, thus adding time to the cycle. Likewise, if pressing the foot pedal doesn't fully open up the valve then full pressure will not be reached either.

- This can be checked by partially dismantling the foot switch and checking the foot switch spring against the photo below to make sure the part is in good condition. It should retain the illustrated shape when not under pressure.

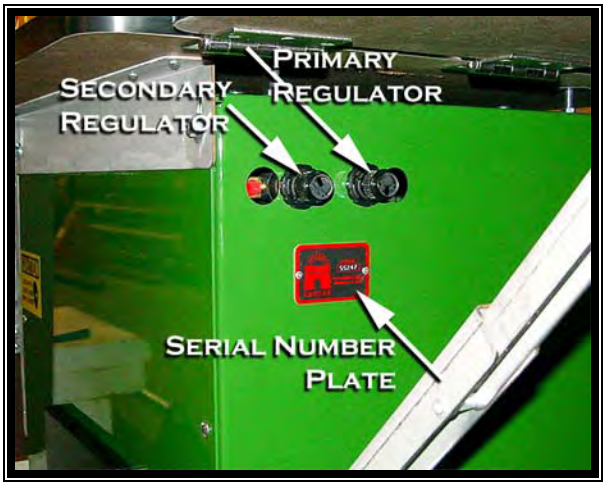
Please note that it is not necessary to dismantle the foot switch to the point illustrated here in order to view the spring.



ADJUSTING SECONDARY REGULATOR

The secondary regulator is the one towards the front of the machine and controls the pressure delivered to the index pins. It is called the secondary regulator. While there is no gauge to check the internal pressure driving the machine, there is an easy way to reset the regulator to factory settings.

- Turn the secondary regulator knob all the way to the left, counter-clockwise so that it is completely closed.



- With the knob all the way to the left, push both of the index pins down manually.

- Slowly turn the secondary regulator back up to the right until BOTH index pins just go up.

- At the point when both pins go up, turn the regulator knob a half turn further to set.

- To decrease the force with which the index pins come down, turn the regulator to the right ¼ turn at a time, until the desired pressure is reached.

Adjusting the Indexing Pins

If it appears that the pins are out of alignment, you can straighten them out by drilling a test board and realigning a Pin in one of the drilled holes. Follow the testing procedure to confirm that they are out of alignment.

- Use a scrap of at least two feet in length and cut a set of holes with the front Drop Gauge down.

- Slide the board over so that either the left or right Index Pin can enter one of the holes that you just drilled.

- Cycle the machine, insuring that the Index Pin is firmly in the hole before bringing the head down.

When drilling, the bits should re-enter the holes without chipping out the edges or kicking the board out. If either of these things happens then the Index Pins need to be re-calibrated.

- To adjust an Index Pin loosen the two bolts holding the Index Pin bracket in place.

- Use a piece of board to cut a full row of holes in. Make sure that there isn't much sawdust remaining in the holes.

- Slide the board over so that the Index Pin will enter the last hole, but still leave the majority of holes underneath the head.

- Bring the head down into the previous holes while watching very closely that the bits are entering in the exact center.

- While the head is down place the Index Pin into the hole (if not already there), and tighten the nuts on the bracket.

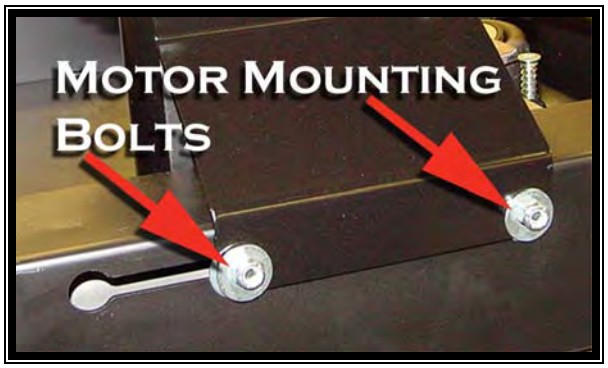
Checking the tension on the belt

If the head significantly slows down or stops while you are drilling, then you may need to check the tension on your belt.

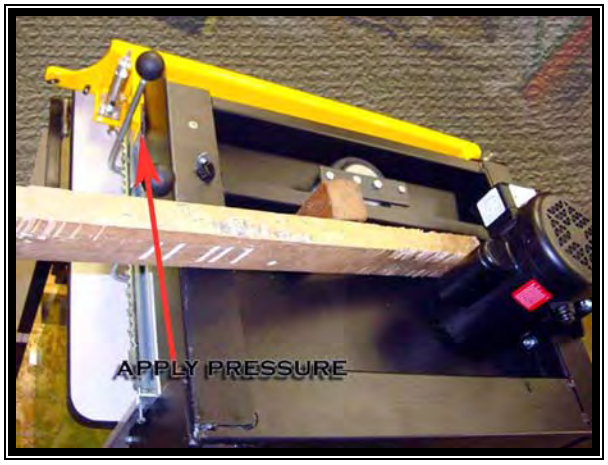
- This is done by simply reaching in the rear of the machine (with the power and air off), and attempting to squeeze the two side of the belt together.
- There should be NO MORE than ¾" of deflection in the belt when you squeeze it together strongly.
- If there is more than 1" of deflection when you squeeze the belt together then the belt needs to be tightened.

Adjusting the tension on the belt

- You will need another person to complete these steps.
- Using a wrench, **LOOSEN** the four 5/16 carriage bolts that hold the motor and motor bracket in place. DO NOT REMOVE these bolts.



- Use a 2x4 as a wedge and a 4x4 as a fulcrum.



- Stand in front of the machine and pull the 2x4 towards your body in order to create enough tension on the belt. Do this while someone else tightens the four carriage bolts.

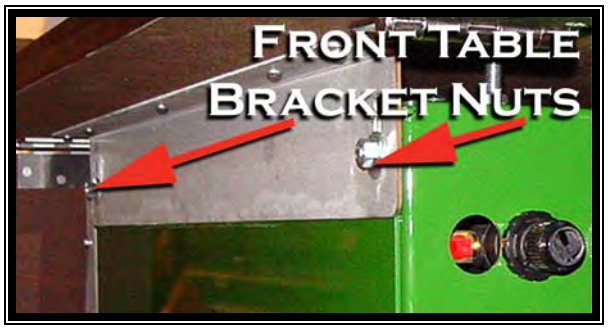
- Once the bolts are tight, test the belt tension through the rear of the machine again and drill a set of test holes.

- Repeat these steps, if necessary, until there is enough tension on the belt per the previous adjustment description

Table Top Adjustment

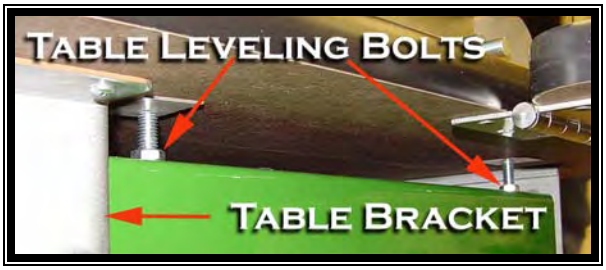
The tabletop is adjustable in relation to the guard frame and head. There should be between a 1/8 " and a ¼ " gap with wood in place. If it is greater then this, the table needs to be adjusted in order for a proper depth hole to be cut.

- Locate and **LOOSEN** the three brackets that lock the table into position. There is one bracket in front and one on each side underneath the table. The brackets are held in place by 9/16" hex head nuts.



- Once the table is loose, locate the four leveling bolts. There are two on each side of the machine on the underside of the table.

- Adjust the bolts up or down and check that the table is level and has the appropriate clearance from the guard.



- It is important to maintain the table in the same level position it was in before the adjustment.

- To do this, the leveling bolts must be turned the SAME NUMBER OF TURNS AS ONE ANOTHER. It may be helpful to mark one face of the hex head, to use as a reference point as the bolt turns.

- Retighten the bracket nuts and drill a set of test holes to make sure that the table stayed level.

Adjusting the Wing Table

The wing tables fold out on either side of the tabletop to extend the work surface. The adjustment for the wing table is inside the body of the machine. Another person will be needed for this adjustment.

- Open the front door of the machine.

- Locate the nuts that secure the wing table arm to the case side.

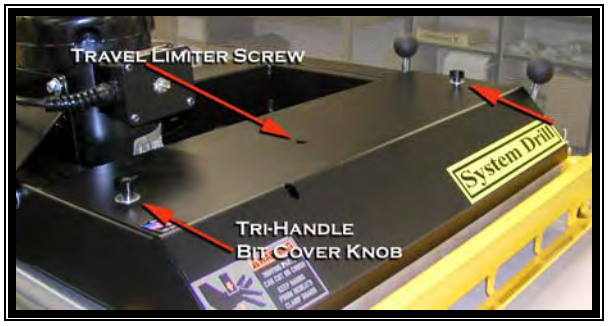
Inside machine view

- Using a 9/16" wrench, LOOSEN the nuts while someone else holds the wing table in the desired position.
- Once the proper position has been achieved, tighten down the nuts.
- Repeat for the other side.

ADJUSTING THE DEPTH OF THE HEAD

The travel limiter controls how far down the head can move towards the tabletop and into the stock. If your holes are not deep enough or they are too deep you may need to make an adjustment to the Travel Limiter bolt.

- Locate the 1/2" hole just left of center in the bit cover on the top of the machine. You'll know you have the right hole because when you look in it there will be a large Philips head screw inside.



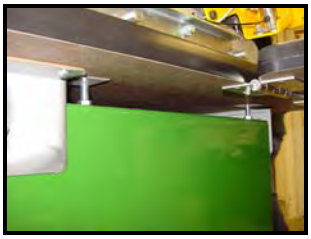
- Using a large Philips head screwdriver adjust the screw through the hole by a 1/2 turn at a time. The adjustments can be made with the machine on or off, but should be made with the drill head UP.

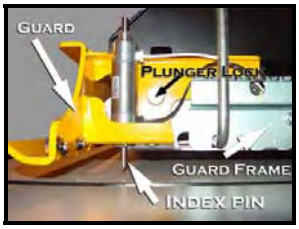
- To drill deeper turn the screw counter-clockwise 1/2 turn at a time. To drill to less depth turn the screw clockwise 1/2 turn at a time.

- If a loud rattling or clanking sound can be heard when the head is down, then the Travel Limiter bolt has been adjusted to drill too deeply and should be backed off JUST until the sound stops.

- If this adjustment has already been made or can't be adjusted any further, then you may need to raise the tabletop to drill deeper.

Description of Parts

	**The Foot Control** Is a dual action foot switch comprised of two air valves that will first activate the indexing cylinders and with increased pressure, will drop the drilling head.
	**Air Pressure Regulators** Are located on the right side of the machine. The rear regulator will regulate how fast the drilling head will descend and the front regulator will adjust how much force the indexing pins exert. The rear regulator is factory set at 6 turns from the fully off and the front is factory set at 5 turns from fully off.
	**Drive Link Belt** The drive link belt stretches from the motor pulley to the main drive pulley. Its job is to transfer the torque of the motor to the bits in the head.
	**Table Leveling Bolts** Located under the worktable are four bolts that raise from the machine case. These bolts support and allow for easy adjustment of the height of the tabletop.
	**Drop Gauges** The front set of the drop gauges factory set to 37mm. The drop gauges can be removed and repositioned.
	**LB-23 Motor** The LB-23 uses a 1 HP Baldor Motor to do the work of turning the head. It uses 120V power and is turned on by the on/off switch located on the front.

	**Indexing Pins** The indexing pins are used after the first set of holes has been cut and the next set need to be aligned with the previous cut.
	**Plunger Locks** The Plunger Locks are located on either side of the yellow guard. They lock the yellow guard into place.
	**Side Stops** These are located on the right and left side of the machine. They slide right or left to set the beginning hole position. The extensions are shipped inside the machine and are put into place during set-up.
	**Bits** The patented tooling for the LB-23 is designed to give maximum performance for an extended period of time. Typically, all of the bits will need to be replaced at the same time but occasionally individual bits will become damaged and need replacement

Maintenance

Head Lubrication

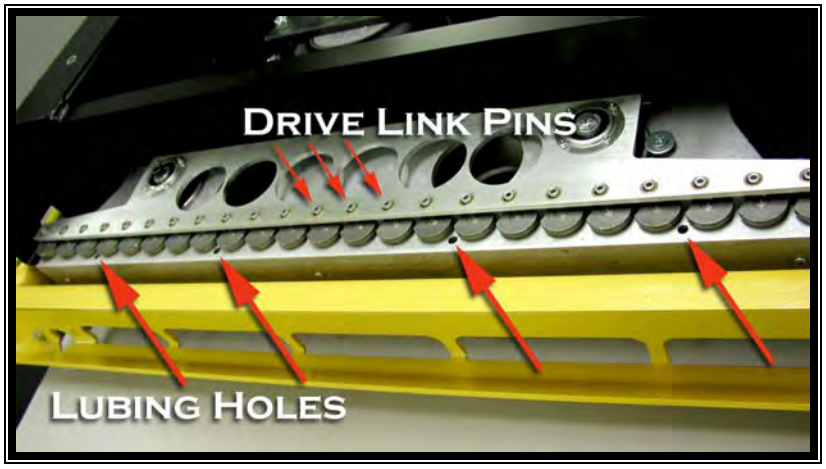
The head should be oiled every 30 to 40 hours of usage. The head, once it is broken in beyond its initial start-up, should run very quietly with no loud metallic racket or grinding.

- In order to maintain the machine in good working order, the head should never be run dry. The head uses oil impregnated bushings that need to stay oiled for optimal performance.

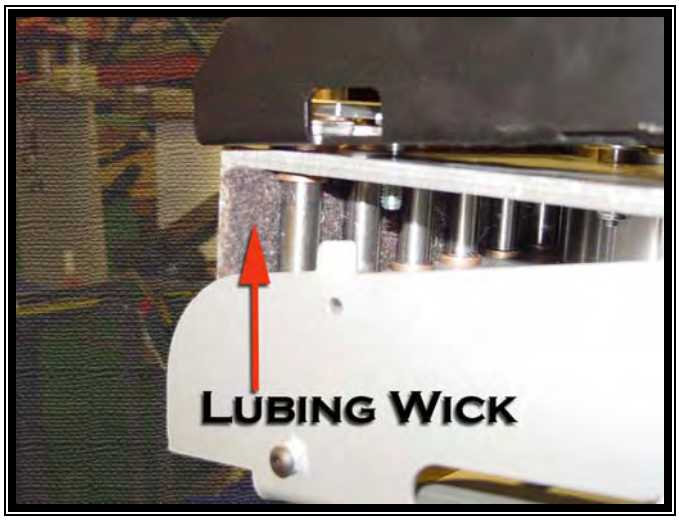
- The oil that is used in lubricating this machine consists of two ingredients: Non-Detergent, 30 WT Motor Oil and Slick 50. The two are mixed at a ratio of 4:1 respectively.

- Loosen the two plastic, tri-armed knobs that hold down the bit cover on top of the machine. Remove the bit cover by lifting and sliding it to your right simultaneously.

- Locate the 4 lubrication holes in the top of the head. These may be partly covered by the spindle housings, requiring a slight repositioning of the housings



- Add 10 to 15 drops of oil to each of the holes. The oil is picked up by the wick and distributed evenly among the spindles



- Locate the Drive Link Pins and add 1 or 2 drops of oil to each. The pins can be oiled once every 30 hours of usage. However, this should only be done if the head is in good adjustment, but still has a metallic rattle.

- After the oil is added, the machine should be left running for AT LEAST 30 minutes and then all excess oil wiped off. If the clean up of the oil is not thorough enough, the machine will throw oil on the stock.

Bit Inspection

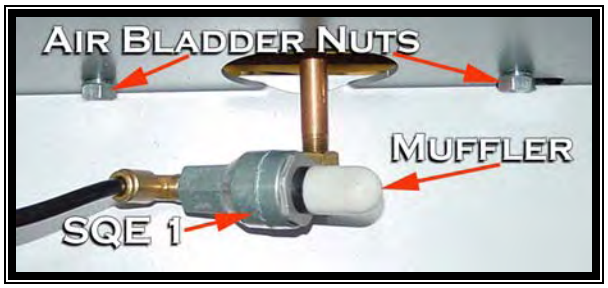
- Look over and inspect all of the bits while carrying out the lubrication process. Look for chips in the bits and replace if necessary.

Troubleshooting

Head is Releasing too Slowly

The SQE valve on the inside of the frame can become clogged with debris. This will keep the head from returning to a neutral position at the end of the cycle.

- Locate the SQE by looking through the rear of the machine.
- It is attached to a brass elbow on one side which has the thickest of the hoses running into it.
- The SQE itself is a 1.5" aluminum fixture molded into a hex on one side.



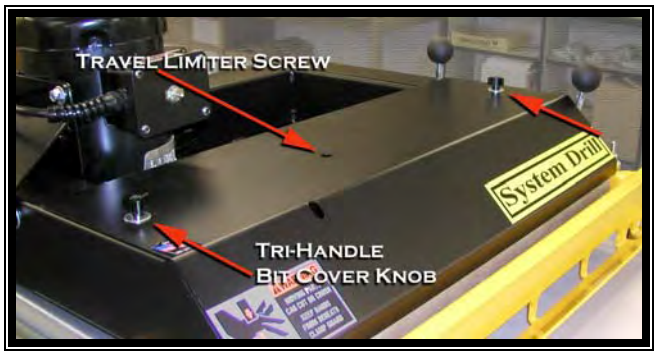
- Attached to the SQE, opposite the brass elbow, is a white, plastic muffler. Remove this muffler by hand and cycle the machine a few times
- If this doesn't clear out the SQE you will need to remove it and clean it more thoroughly with alcohol and compressed air or you will need to replace it.

If the SQE needs to be removed for replacement you need to begin by first removing the rear stop.

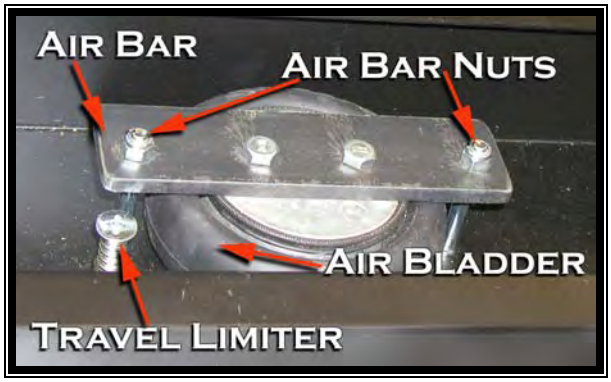
- Make sure the machine power is off and the air is disconnected.
- Locate the Fixed Rear Stop. It is held in place by two 7/16" nylock nuts on the underside of the stop.

- Remove the stop, but DO NOT adjust the Rear Stop bolts sticking out of the rear of the machine that butt up against the rear stop.

- Remove the drill cover on the top of the machine by loosening the three-pronged knobs.



- Locate the two 1/2" nylock nuts that secure the air bar that runs across the top of the air bladder.



- Use a pointed file or a scribe to mark a reference line across the nylock nuts and the bolts they are attached to. This line will be used as a reference mark for reassembling the air bladder assembly.

- After scribing a clear line, use an open or boxend 1/2" wrench to remove the two nylock nuts. VERY IMPORTANT: Count the number of turns from the scribed reference lines it takes to remove the nuts. When reassembling, this count will be used to recalibrate the air bladder back to the original setting.

- Remove the nylock nuts, but be careful to keep them in a way that they do not get mixed up. It's important that the nuts go back on the bolts they came off of.

- With the nylock nuts removed, you can lift the air bar off of the air bladder enough that it clears the drill frame.

- Turn the air bladder and the air bar counter-clockwise until you hear the SQE fall inside the machine.

- Reach inside the rear of the machine with one hand (or get assistance) and turn the air bladder with the other until the SQE is fully unscrewed from the air intake for the bladder.

- Disconnect the large air hose from the push-in fitting attached to the SQE and remove the SQE from the rear of the machine.

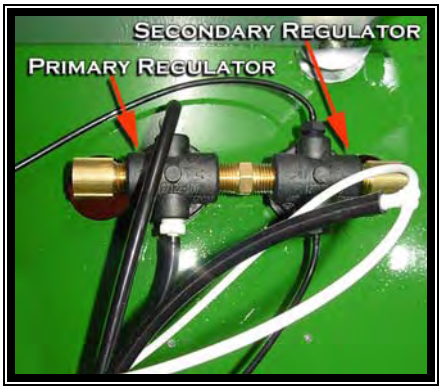
Index Pins are not Coming Back Up

Begin by checking the Air Pressure at the Secondary Regulator.

- **Refer to Machine Adjustments for the Instructions**

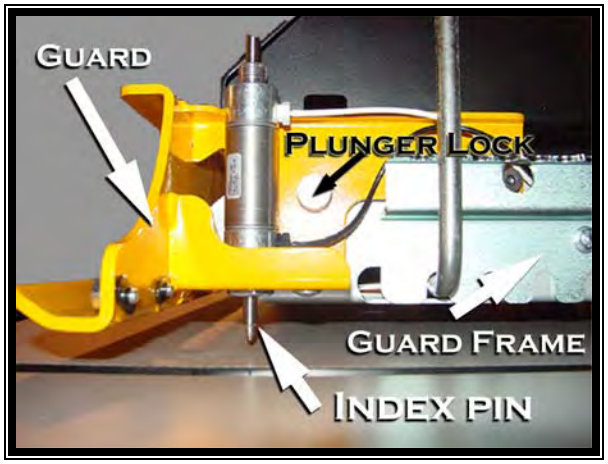
After you have checked the regulator you will next want to check the hoses at the secondary regulator. The hoses that supply the air to the Index Pins run from the secondary regulator. These hoses run through the Guard Frame and are visible when looking into the opening at the rear of the machine.

- Use a bright light to trace the hoses from the secondary regulator to the white & black barbs on the Index Pins.



- When tracing the hoses, you should be looking for kinks or splits in the material. These are most likely to occur in places where the hoses run out of the machine and are susceptible to being pinched.

- Once you trace the hoses all the way back to the Index Pin, then make sure that you have a firm connection at the barb that connects into the pins.



- Check the barbs for any splits or cracks. This is especially likely to occur where the barb nipple comes out of the fitting part of the barb.

Loud Racket When Drilling

If your machine is making a loud racket when drilling you will need to check a few adjustments on the machine. If necessary, refer to the Machine Adjustments section to adjust the depth of the head and adjust the tabletop. If you have checked these and the machine still has a racket you will need to check the guard frame.

- The Guard Frame could be moving from left to right on the Drill Frame at the rear of the machine.

- The short hex bolts on the sides, and at the rear of the machine should be checked.

- Locate the 7/16 hex head bolts on the sides, towards the rear of the machine. The will have a jam nut on them.

- Loosen the jam nut and then tighten or loosen the bolt to the desired tension.

- Retighten the jam nut.

Warranty Information

Castle, Inc. uses only the highest quality materials available for the construction of our machines. Your LB-23 System Drill is warranted for one full year from the date of purchase against workmanship or material defects under normal use and service. We are not responsible for negligence, misuse or accidents. We suggest any and all machine maintenance or repair be discussed with an authorized Castle Representative prior to any disassembly. We will gladly answer any questions you may have prior to any part removal.

Castle will, in its sole discretion, either repair or replace machines that are found to be defective. This shall be the End User's sole remedy under this warranty. **Castle will not, under any circumstances, be liable to the End User for consequential, incidental, special or exemplary damages, or for loss of profits, revenue or use. Further, Castle disclaims any warranty, expressed or implied, as to the merchantability or fitness of a Castle product for any particular purpose.**

Castle, Inc. warrants the one (1) electric motor for one (1) year from date of purchase. We suggest you keep your receipt in a safe place will need a copy for any repairs or replacements.

For Technical Assistance, Parts & Tooling:

Call 800-282-8338, Monday through Friday, 8:00am - 4:00pm, Pacific Time
Fax: 707-765-0953