Castle Screw Pocket Machine

Model TSM-21

with Mead Valves

Operator Manual

Castle, Inc.
Petaluma, CA
800-282-8338
U.S. Patent No. 4603719

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DO NOT ATTEMPT TO OPERATE THIS MACHINE UNTIL YOU HAVE READ THIS MANUAL.

Safety Notification

***WARNING*: The Castle Model TSM-21 Pocket machine was designed with operator safety as a priority. This machine was carefully prepared for shipment at our factory. Upon receipt of the 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 the 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)
- TSM-21 Operator Manual and Parts Explosion
- Two (2) PC 6902 Router Wrenches
- One (1) PC 7301 Router Wrench
- One (1) #2 x 6" Square Driver bit
- Manual and Warranty Card for PC 6902 Router
- Manual and Warranty Card for PC 7301 Router
- Bit Gauge
- Two Door Handle Assemblies
  - 2- Door Springs
  - 2- Bolt ¼-20
  - 2- T-Handle

Machine Requirements

Important: Do not use an extension cord to power the TSM-21.

Power: 110 VAC, 20 Amp Circuit

Air Supply: 85 PSI minimum, 150 PSI maximum

Dust Collection: Although not absolutely necessary, the TSM-21 will function better with proper dust collection attached. A vent for this purpose has been provided. If attaching a dust collection system remove the cover plate over the vent opening in the back door. Adding dust collection will keep the router motors cool and free from a buildup of sawdust in order to prolong motor life.

Setting Up Your TSM-21

Always use eye protection when operating power equipment.

- Your Castle TSM-21 pocket machine was set up and tested for proper operation at the factory. It is normal to find a small amount of sawdust in the TSM-21 from this process.

- Verify that the power switch is turned off. Remove the power cord and foot pedal from inside the machine.

- Remove the brass elbow from the black urethane hose by pushing the floating ring towards the elbow and pulling the hose at the same time.

- Thread the elbow into the top of the clamp cylinder. It is pre-primed and self-sealing. Point it towards the back of the machine and firmly push the hose back into the fitting. (Figure 1)

Figure 1 

- Connect a **clean dry** air supply to the left side of the machine with a minimum supply of 80 PSI. The TSM-21 has an internal air pressure regulator that is preset to 85psi. Using an air supply of less than 80 PSI will result in insufficient clamping force, which can cause material shifting and possible injury to the operator.

- We recommend that you use an inline filter/water trap. **Do not connect a lubricator to the machine**. (Most lubricants will damage the pneumatic seals in the air system.)

- Using the wrenches located in the back of the machine make sure the router bit is secure in the collet.

- Inspect the T-Handle for the drill motor on the carriage (see Figure 2) and the U-bolt connection for the router motor, that they are secure and the motors are held tightly.

- Install work top with 4 flat head bolts and nylock nuts supplied, go to the back of the machine and by hand, move the carriage forward and backward, mimicking its working motion.

- Plug the machine into a grounded 110V 20-amp outlet. Place a piece of scrap against the face plate while depressing the safety buttons, and step on the foot pedal. Be sure to keep your hands clear of the clamp. A full cycle should take 1 - 1 ½ seconds.

- Inspect the pocket. If the drilled hole is off center, it can be centered using the adjusting nut just below the drill motor. (Figure 2)

Figure 2

- The router feed rate is adjusted using the flow control knob next to the air supply port. Turning it clockwise will slow feed rate, counter-clockwise will speed it up. If the feed rate is too slow it will burn bits.

Operating Instructions

Always use eye protection when operating power equipment.

- With the power switch turned off, check to see that the carriage moves freely by hand and is returned to the neutral position. Neither the router bit nor the drill bit should be protruding from the machine with the machine at rest.

- Place the foot switch in front of the machine in a safe and comfortable position.

- Turn the power switch on.

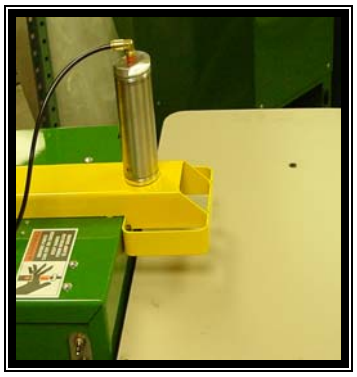


Figure 3

- Place the work piece to be pocketed on the worktop. Slide it under the clamp guard and firmly push it against the face of the machine depressing the safety buttons. The pocket will be cut at the point directly under the center of the hold down cylinder. (Figure 3)

- Press and release the foot switch to activate the cutting cycle.

- When the cycle has been completed the clamp will automatically release the material.

- A typical machine cycle will take from 1 to 1 ½ seconds to complete if the machine is functioning properly.

- If the machine fails to cycle properly, call Castle at **(800) 282-8338**

Machine Adjustments

The Castle model TSM-21 is designed for use on 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".

Router Feed Rate Adjustment

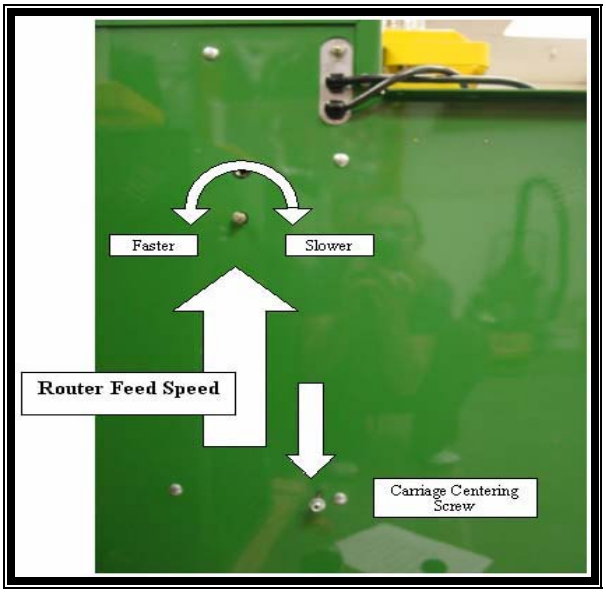


Figure 4

When switching between materials of different density, it may be necessary to adjust the pocket router feed rate to achieve optimum performance. In general the desired feed rate is slower for harder materials.

- The Feed Rate Adjustment knob is located just under the air inlet port on the left side of the machine as you face it. (Figure 4) This knob is usually locked in place by a nut that will need to be loosened. Turn the knob as described below to change the router feed rate:

- Turn clockwise to slow router feed rate.

- Turn counter-clockwise to increase router feed rate.

Caution: The carriage movement is accompanied by a slight "thump" while cutting, this is normal, but if the "thump" is pronounced and the machine shutters, this usually means the router feed rate is set too fast.

Drill Feed Rate Adjustment

The speed the machine drills the pilot hole is set at the factory. This is a function of the air pressure set at the internal air regulator.

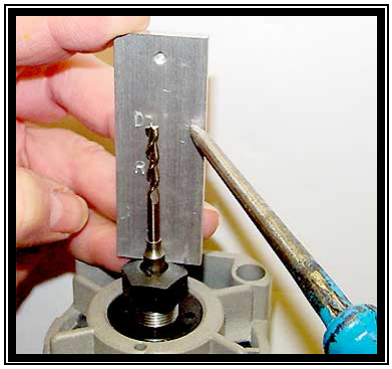
- The drill feed rate will be best when the air pressure is set at 85psi.
- Normally you won't need to adjust the regulator. However, if your drill cycle slows down significantly over time an increase in the regulator setting will correct the situation. Do not increase air pressure beyond 85psi. You can check this by putting a pressure gauge on the line to the clamp cylinder and cycling the machine without stock in place and the motors off.

Pilot Drill Depth Adjustment

The pilot drill operation works best when the drill depth is adjusted so that the drill bit just barely breaks into the pocket. If the drill bit extends farther than is necessary, it could cause shorter bit life.

Figure 5

- The drill bit setting is determined with the Bit Gauge (Figure 5), included with your machine.
- To use, simply set the plate on top of the collet and use an awl to scratch a reference line in the soft aluminum where each bit should be. (Figure 6)

Figure 6 

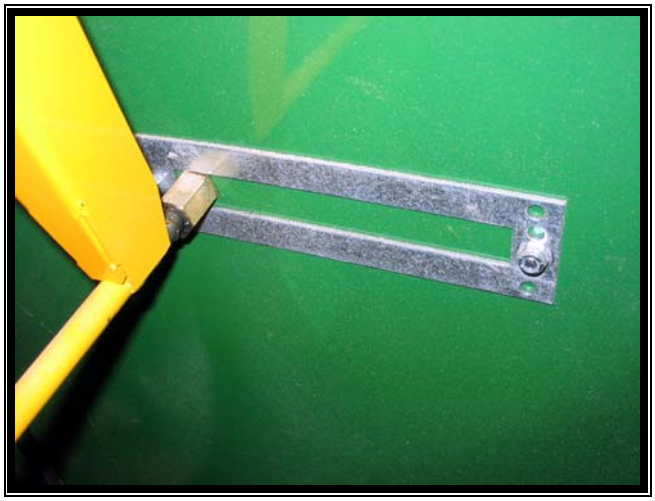
- The plate has two sides that can be used as settings for different processes in the shop.

Pilot Drill Height Adjustment

- On the sides of the cabinet box loosen but do not remove the nuts securing the pivot point of the motor carriage assembly to the cabinet box.

- From the back door:

  - The carriage is mounted on into the case on a plate. (Figure 7)

Figure 7 

  - Begin by removing the nut and bolt for the plate on the right side that are closest to you.
  - Next loosen, BUT DO NOT REMOVE, the nut on the same plate that is farther away from you.
  - Slide the plate in an upward motion one hole position to raise the drill by 1/16".
  - Reattach the nut and bolt closest to you, tighten down.
  - Tighten nut on far side
  - Repeat for the other side.

- On the sides of the cabinet box tighten the nuts securing the pivot point of the motor carriage assembly to the cabinet box.

Pocket Depth Position

The pocket cutting bit is set at the factory to rout at optimal depth in material between 5/8” and 7/8” thickness.

- To rout ½” material it is easiest to place a 1/8” shim on the worktable and place your work piece over it.

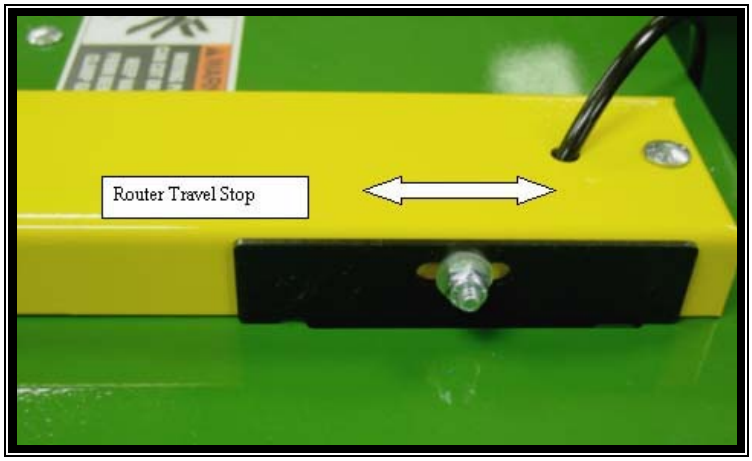
- The optimal router setting is determined by seating the standard Castle Router bit (RM-38, CUR-38 or RM-38C) as far down in the collet on the router as it will go and then using the bit guide provided to set the depth. Refer to the “Pilot Drill Depth Adjustment” for steps to do this.

Pocket Distance Adjustment

The offset distance from the end of the pocket to the edge of the work piece is called the “web.” (Figure 8) It has been factory set at 5/8” to accommodate 1 ½” screws. We do not recommend that this distance be changed to less than 5/8 ”.

Figure 8

- If you are using 1¼” screws you may shorten this distance by adjusting the router stop plate. (Figure 9)

Figure 9 

- To adjust the web, locate the stop plate bolt on the rear right side of the yellow clamp guard on top of the machine. This is a black metal plate that extends up through the case top alongside the clamp guard. You will find a nylock nut that secures the black router stop plate to the clamp guard housing. Loosen this nut and slide the black stop plate toward the rear of the machine slightly to shorten the web. To increase the web, slide this plate toward the front of the machine. **Be sure to tighten the nylock nut** securely when you have finished adjusting the router stop plate to prevent shifting during operation.

CHANGING THE BITS ON YOUR MACHINE

To change the bit on either your drill or your router you will need to remove the motor from the carriage. You **do not** need to take the tabletop off to change the bits.

- Open the rear door and look at the black drill motor at the top of the carriage.
- Just to the right of that is a black T-Knob that tightens on a large U-Bolt that holds the router in place.
- Un-Plug the motor you wish to change.
- If changing the bit on the router, loosen the T-Knob a few turns to provide enough slack to drop the motor down and then out the rear door. (Figure 10)

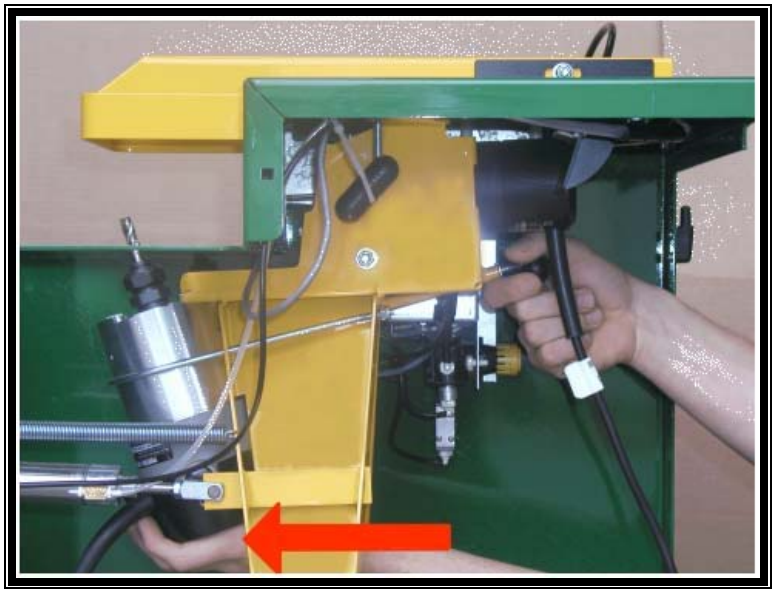


Figure 10

- When re-installing make sure the motor is pushed up all the way to seat flush with the tabs on the yellow carriage (if unsure remove table top to confirm location).

- If changing the bit on the drill, loosen the T-handle to the left of the drill motor and slide the motor out from the rear of the machine. (Figure 11)

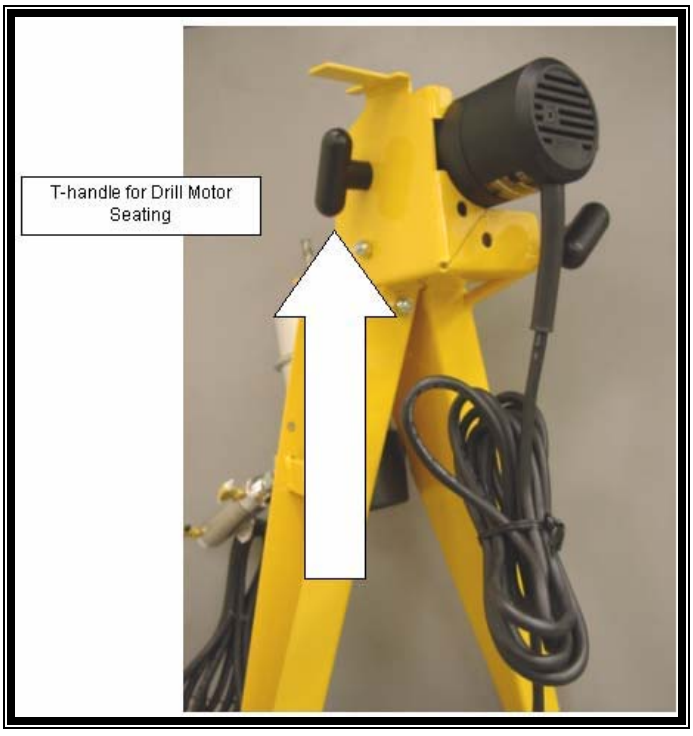
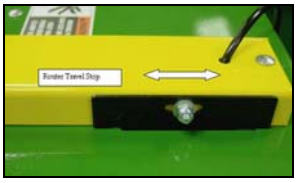
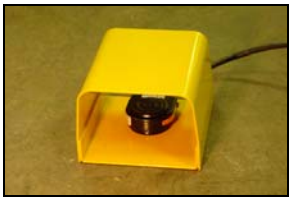
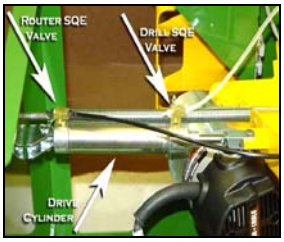
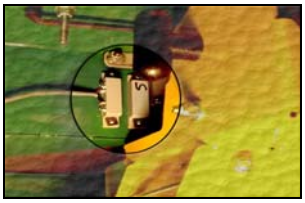


Figure 11

Description of Parts

	1. **Clamp Cylinder**: The large cylinder on the top of the machine is a clamp to hold the stock safely in place during operation. This is a single acting, spring return pneumatic cylinder with a padded foot on the end of the cylinder rod. The clamping force exerted is directly proportional to the amount of air pressure received by the machine. The clamp guard secures the clamp cylinder.
See above	2. **Clamp Guard:** The yellow metal clamp guard on top of the machine serves to secure the clamp cylinder and to safeguard the operator from the clamping and pocket cutting action.
	3. **Router Stop Plate:** Located at rear of machine, this black metal plate extends up through the top of the case along the right side of clamp guard. The position of this plate determines the size of the "web."
	4. **Foot Pedal and Guard:** The foot pedal is mounted inside a yellow metal guard and is connected to the machine by an electrical cord. When pressed, the foot pedal will activate the machine cycle only if the safety buttons are depressed by the stock.
	5. **Safety Buttons:** Two small silver button head screws that project from the front of the machine under the clamp guard. The machine does not cycle unless one of these buttons is depressed simultaneously with the foot switch.
	6. **Safety Switch:** This magnetic proximity switch is mounted on the inside top of the TSM-21. It is activated when the safety buttons are depressed by a piece of stock.
	7. **Motor Carriage:** The motor carriage is the yellow A-frame structure inside the machine. Both the router motor and the drill motor are mounted to this carriage. The carriage is moved back and forth through the machine cycle by the drive cylinder, which links the carriage to the machine case in front.

	8. **Drive Cylinder:** This double acting pneumatic cylinder connects the motor carriage to the machine case and moves the carriage through the rout and drill cutting phases of the cycle. The cylinder rod extends to move the carriage to the rear of the machine, which brings the router up to cut the pocket. When the cylinder rod is withdrawn, the carriage moves forward and the pilot drill is extended to bore the pilot hole into the pocket.
	9. **Router Stop Switch:** This magnetic proximity switch is mounted on the router stop plate inside the rear of the machine. At the end of the rout phase of the cycle, the carriage interrupts this switch to signal the start of the drill cycle, sending the carriage forward.
	10. **Drill Stop Switch:** This magnetic proximity switch is mounted on the inside front of the machine case to the left of the carriage as seen from the rear. At the end of the drill cycle, the carriage interrupts this switch to signal the end of the pocket cutting phase of the cycle. At this point the carriage returns to the neutral position and the clamp releases the stock.
	11. **Control Box:** The control box is the sheet metal enclosure that houses the electrical and pneumatic controls. Mounted on the control box and accessible from the outside are the router speed control valve, the air inlet port, and the power switch. Also mounted on the control box and accessible through the rear door are the pressure regulator, the duplex power outlet for the motors and the solenoid valves.

MAINTENANCE

WARNING! ***Electrical Hazard: Do not attempt to service control box components. Contact a Castle, Inc. service technician for proper service information.***

MACHINE

The model TSM-21 requires very little maintenance. However, to ensure productivity and longevity of your Castle Pocket Cutting Machine, it is essential to follow a few simple steps. How often these steps are performed depends upon the number of hours the machine is operated each day. As a general rule, operators should visually inspect the machine at the start of each work shift in the following manner:

- Check power cord and foot switch cord for wear or damage.
- Ensure that router bit and drill bit are clean, sharp and undamaged.
- Keep the router and drill motors free from dust build up.
- Check for proper safety switch function. Turn the machine on and press the foot switch without a work piece against safety buttons. The machine should not cycle if the safety switch is working properly. If you suspect a safety switch malfunction, contact a Castle, Inc. service technician at 1-800-282-8338 as soon as possible for corrective action.
- **Do not introduce lubricants, oils, or solvents into the pneumatic system. This can cause irreparable damage to pneumatic components.**

Motors and Bits

The life of the machine is directly related to the care of the motors used to cut the pocket and pilot hole. Because the motors are enclosed in the machine where they can over heat if used beyond their operating range, it is important that the maintenance guidelines provided in the Porter-Cable instruction manual be strictly followed.

- Periodically during operation, blow out the air passages on both motors with compressed air. ***Caution: always wear safety goggles when using compressed air.***

- Do not run the motor for more than two hours at a time.

- To prolong motor life, and avoid costly downtime, it is recommended that a dust collection system be connected to the machine. A port has been provided on the left side of the machine for this purpose. An air inlet vent on the rear door works with the dust collector to keep the motors cool.

- To ensure safe and effective operation, make certain that there is at least 85 PSI air pressure to the machine. Check cycle time of machine for proper duration. A typical cycle will last from 1 to 1 1/2 seconds. A cycle significantly longer than this may indicate low router feed rate, or low internal air pressure. This will lead to excessive bit wear and shortened motor life.

- It is suggested that a two flute, carbide tipped CUR-38 Castle bit be used when pocketing in materials where glues are used in binding the stock. For example, particleboard, Melamine, MDF, etc. This bit leaves a clean cut and offers good life when cutting in these materials. This bit should NOT be used in solid woods because it will leave an unclean and ragged pocket.

- When cutting pockets exclusively in hard woods such as maple, oak, ash or alder we recommend the RM-38, the cobalt bit which is shipped with your machine. The RM-38 will cut in any material, although the exposure to the glue found in certain materials like those listed above will lead to premature wear on the bit.

- If pockets are being cut in both types of materials, (i.e., particleboard and hard wood) then it is suggested that the RM-38C, a solid carbide bit, be used. Because glues do not break down carbide as rapidly as cobalt, the RM-38C will last four times longer than the RM-38 when cutting alternately in both composites and hard wood.

- The pilot hole is cut with a 9/64” drill bit, CDB-964. This size drill bit comes with your machine. Also available are the 7/64” and 3/16” size drill bit.

- All of the tooling is available through Castle, Inc. Feel free to contact your local Castle dealer or our parts department TOLL FREE at 800-282-8338 for information and pricing on tooling and accessory products for your TSM-21.

TROUBLESHOOTING

MACHINE WILL NOT START THE CYCLE

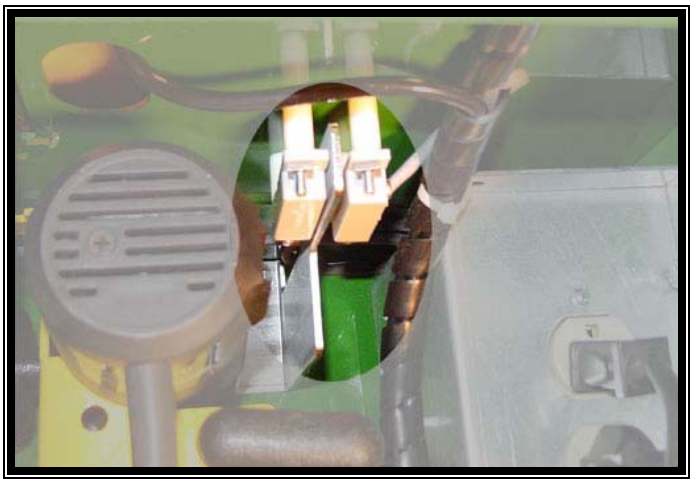
If you press on the foot pedal while your motors are on but the clamp isn't coming down and the routers aren't coming up, then you have failure in the footswitch or the safety switch. The air pressure may also be set too low or not attached correctly.

- Refer to the "pocket is being cut but no pilot hole" section for steps on how to reset the air pressure.

The Safety Switch

Solution Steps:

The safety switch on the TSM-21 consists of a magnetic actuator on one side (no wires) and a magnetic reed switch on the other (with wires). (Figure 12) When the safety buttons at the rear of the worktop are depressed by the stock, they raise a blade inside the machine that rests in between the safety switch and the magnet. The assembly is wired in such a way that when the blade is raised the switch closes and electricity is allowed to flow to the foot pedal.

Figure 12 

- First make sure that the side of the magnet housing with the notch in it is facing the safety blade. This ensures that the magnet is as close to the switch as possible inside the housing.

- If there is no notch in the housing, then detach it from the machine and physically inspect it. Make sure that the magnet is turned so that it is closest to the safety blade.

- If the above steps don't work then test for continuity at the switch by connecting the ohmmeter leads to the reed switch side of the assembly.

- When the magnet is placed against the reed switch then continuity should be registered.

- If continuity IS registered then the distance between the mounted assembly needs to be reduced by 1/16 of an inch on each side. First, loosen the screws holding the switch and magnet to the mounting brackets. Squeeze them together and then tighten the screws to reduce the distance.

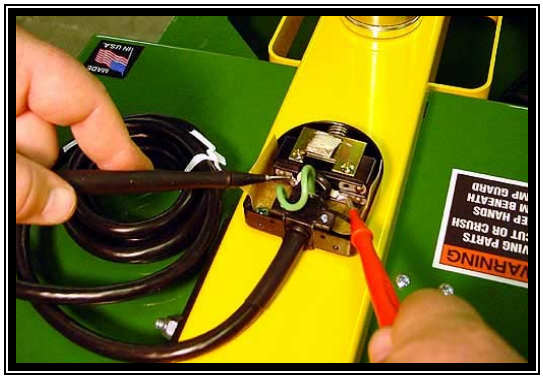
- If this still doesn't fix the problem then a new switch assembly (magnet and reed switch) should be ordered.

The Foot Switch

Solution Steps:

The foot switch is a simple mechanical micro-switch operated by the pedal and a spring. The switch is wired normally open, so a closure begins the cycle.

- Turn the power to the machine off.

Figure 13 

- Turn the foot pedal and guard over and remove the two small screws that hold the pedal to the guard.

- Use a flat tip screwdriver to pry the pedal free from the yellow guard. It is held by a silicone caulk.

- Use a flat or phillips tip screw driver to remove the two screws on the left and right side of the pedal. This will allow the pedal to come apart exposing the switch underneath.

- The two leads of the Ohm Meter can be put to the connections on the switch while it is still in the pedal. (Figure 13)

- Press the switch to determine if the switch has continuity.

THE CLAMP IS RELEASING SLOWLY

If the machine cycles at a normal rate, but the clamp is releasing slowly then a few tests need to be run to determine a cause and a solution.

Figure 14 

The clamp cylinder airline may have developed a crimp or leak in the hose.

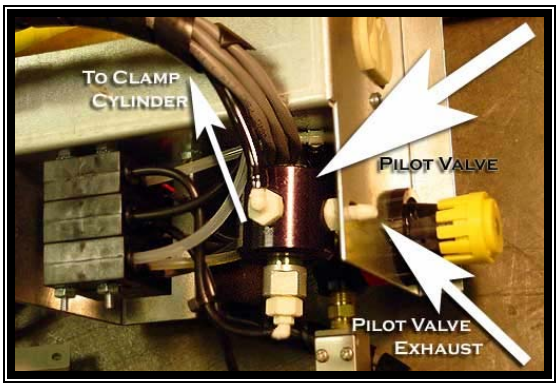
Solution Steps:

- Using an alternative air source insert it directly into the push-in fitting on top of the clamp cylinder.
- Turn on and then off.
- If the exhaust for this alternative air source is good, then the cylinder should retract at a normal rate.
- If not then the cylinder needs to be replaced. (Figure 14)

The pilot valve located in the control box may have an obstruction in the exhaust port.

Solution Steps:

- Open the rear door of the machine and locate the small, white plastic barb to the left of the yellow (or black) knob. (Figure 15)

Figure 15 

- This small exhaust port can slip behind the metal plate of the control box and/or get debris stuck in the hole.

- Make sure that this port is clear and open and that the port is not stuck behind the sheet metal.

If the solenoid fails or becomes blocked it will cause either a slow release of the stock or a lack of clamping pressure.

Solution Steps:

The clamp solenoid is the pneumatic switch that signals the pilot valve to send full pressure to the clamp cylinder, which provides the clamping action.

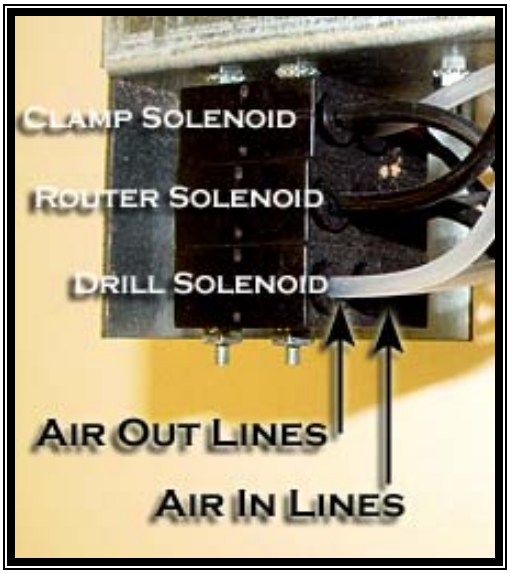


Figure 16

- The solenoids are the three stacked black boxes located behind the pilot valve near the control box. The clamp solenoid will be the top box in the stack. (Figure 16)

- Turn off air and remove both air lines from the clamp solenoid valve. The air lines are removed by pressing on the push-in fitting rings where the hoses go into the solenoid. The space is tight for large fingers so you may need to use a pair of needle-nosed pliers to get in there to press the rings and slide hose out. To re-install, slide hose in until it meets resistance and then push in hose another 1/2".

- The "air in" line is located towards the case of the machine and the "air out" is closer to the center of the machine. (Figure 16)

- Turn the air back on and use the "air in" line (which will be flowing with about 85 PSI) to clean out both open ports on the valve.

- Turn off the air and insert the "air in" line back into the "air in" side of the valve.

- Un-plug or turn off both router motors.

- Put a board against one of the safety buttons and the hit the foot pedal. Air should now be flowing from the “air out” side of the valve.

- Repeat these steps a few times to ensure all contaminates are expelled, then insert remaining line back into the “air out” side of the valve

- Turn routers back on and cut a test pocket.

The router comes up and cuts the pocket but the clamp doesn’t release

If the clamp doesn’t release and the drill doesn’t come out then the router stop switch may have failed.

Solution Steps:

- Test the continuity of the reed (wired) side of the switch for failure. (Refer to the Safety Switch Solution Steps for instruction on how to test for continuity) If no continuity is registered, replace the reed (wired) side of the switch.

- If continuity is registered then the magnet (no wires) needs to be adjusted approximately a 1/16” further away from the reed side. (Figure 17)

Figure 17 

- This is a trial and error adjustment. If you attempt to cycle the machine after an adjustment and the router never comes out but the drill does, then you have moved the magnet too far away from the reed side. Adjust the magnet until you get the machine to cycle normally.

The pocket is being cut and the drill comes up but doesn't finish the pilot hole

There are two possible causes of this issue. Either a switch has failed or the air pressure driving the carriage has been compromised. To determine the cause of the problem, cycle the machine until it stalls out during the drill phase.

- Push the carriage by hand (you can access the carriage through the back door.)
- If the cycle finishes when pushed manually then you have an air pressure issue.
- If the drill stays out and you can't get it to finish when pushed by hand then you need to replace the end of drill switch.

Drill Stop Switch

Solution Steps:

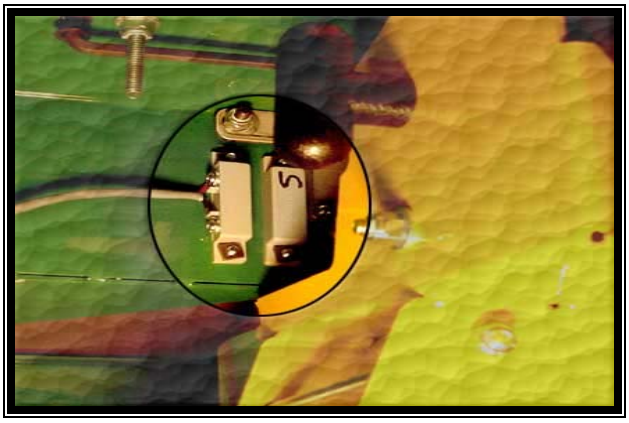


Figure 18

The drill stop switch is a magnetic switch that consists of a magnetic actuator on one side (no wires) and a magnetic reed switch on the other (with wires). (Figure 18) When the carriage reaches the end of the drilling phase the switch signals the air to stop flowing into the drive cylinder. If the switch is bad or the magnet has lost some of its potency then the machine will not sense the end of the drill cycle properly and the drill will stay out. The drill stop switch holds a closed circuit until the carriage comes forward and interrupts the magnetic field.

- Disconnect power and air.
- Test for continuity at the switch by connecting the ohmmeter leads to the reed (wired) switch side of the assembly. When the magnet (no wires) is placed against the reed switch then continuity should be registered.
- If no continuity is registered then the reed switch needs to be replaced.

- If continuity IS registered then the distance between the mounted assembly needs to be reduced by 1/16 of an inch on each side.

- The laminate strip on the front of the machine must be removed to access the screws that retain the switch.

- When installing the new switch it does not matter which side the red & black wire go to.

- The magnet is sealed into its housing closer to one side than the other. When installing the magnet, make sure that the side the magnet is sealed closer to is facing the switch.

Air Pressure

Solution One Steps:

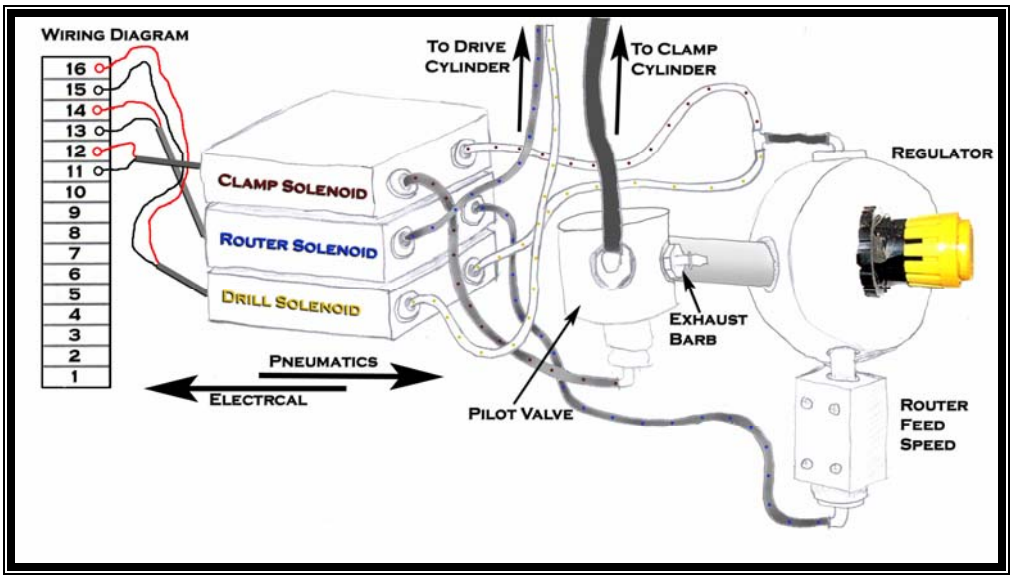


Figure 19

The drill solenoid is an air switch that controls the flow of air to the drive cylinder. (Figure 19) The drive cylinder, in turn, provides the pressure to move the carriage (with the drill attached) through the cutting part of the cycle. If the air line becomes blocked the drive cylinder won't have enough pressure to pull the drill all the way (or potentially any of the way) through it's stroke. To clear the drive cylinder lines from any potential debris, follow these steps.

- Open the back door of the machine. Inspect the hoses coming from the drive cylinder for holes and/or pinches.
- Unplug these two drive cylinder hoses from the rout and drill solenoids. This is done by pressing on the push-in fitting rings where the hoses go into the solenoid. The space is tight for large fingers so you may need to use a pair of needle-nosed pliers to get in there to press the rings. The hoses should remain attached to the drive cylinder at the cylinder SQEs.
- Next, you will need to dry cycle the machine. To do this, first turn off the power switches at the router motors. Next, hold in one safety button with a scrap of wood, being careful to leave room for the router to come up.
- Press the foot pedal.
- Reach into the rear door opening and firmly grasp the yellow carriage. Steadily pull and then push the carriage fully back and then forth to force air through the hoses. It's important to allow the pressure generated to fully exhaust out the hoses.
- Make sure air is coming out of the solenoid while dry cycling.
- This should kick any blockage out of the brass SQEs where the hoses attach to the cylinder, as well as clearing any potential debris out of the hoses.

- Press the hoses firmly back into the push-in fittings. Identify and replace any leaking hoses or switches. Turn router motor switches back on.

Solution Two Steps:

The air pressure may need to be adjusted at the pressure regulator inside the control box. The air pressure from the regulator determines the drill feed rate and overall speed of the machine. The factory setting is 85 PSI. This regulator is adjustable and should be checked periodically as well as any time the performance of the machine becomes unstable or slow. Its important that at least 85 PSI is going into the machine from the compressor. Other machines on the same line as your Castle machine can affect this pressure.

NOTE: Too slow will burn drill bits and cause separation at the shank. Too fast will put too much pressure on the drill bits and cause them to break and/or cut over-sized holes.

- Pull-click the knob at the back of the case. (Figure 20) Back it off fully - counter-clockwise. After the knob is fully backed off, open the valve up 6 to 7 full turns clockwise. This will bring the internal air pressure to approximately 85 PSI.

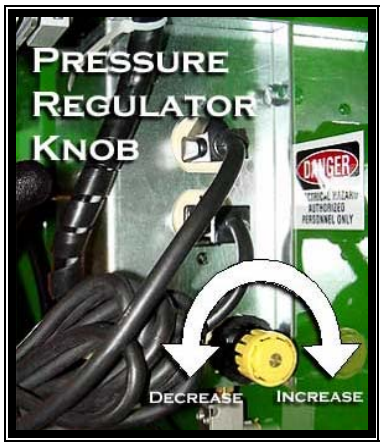


Figure 20

- Push-click the knob back down.

- Test cut a few pockets. Remember, too much or too little air pressure can effect your tooling. You will want to make sure the setting of the internal regulator does not go above 85 PSI and the cycle time on the machine should be 1 to 1 ½ seconds. Adjust the regulator and flow control as necessary to get these settings.

Warranty Information

Castle, Inc. uses only the highest quality materials available for the construction of our machines. Your TSM-21 Standard Duty Pocket Machine 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, at its sole discretion, may 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.**

Porter Cable warrants the two (2) electric motors 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.

After the first year, check the Porter Cable manuals (enclosed) for the service station nearest you.

For Technical Assistance, Parts & Tooling:

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

Revised Sep.2004

Castle Model TSM-21

Standard
Screw Pocket Machine

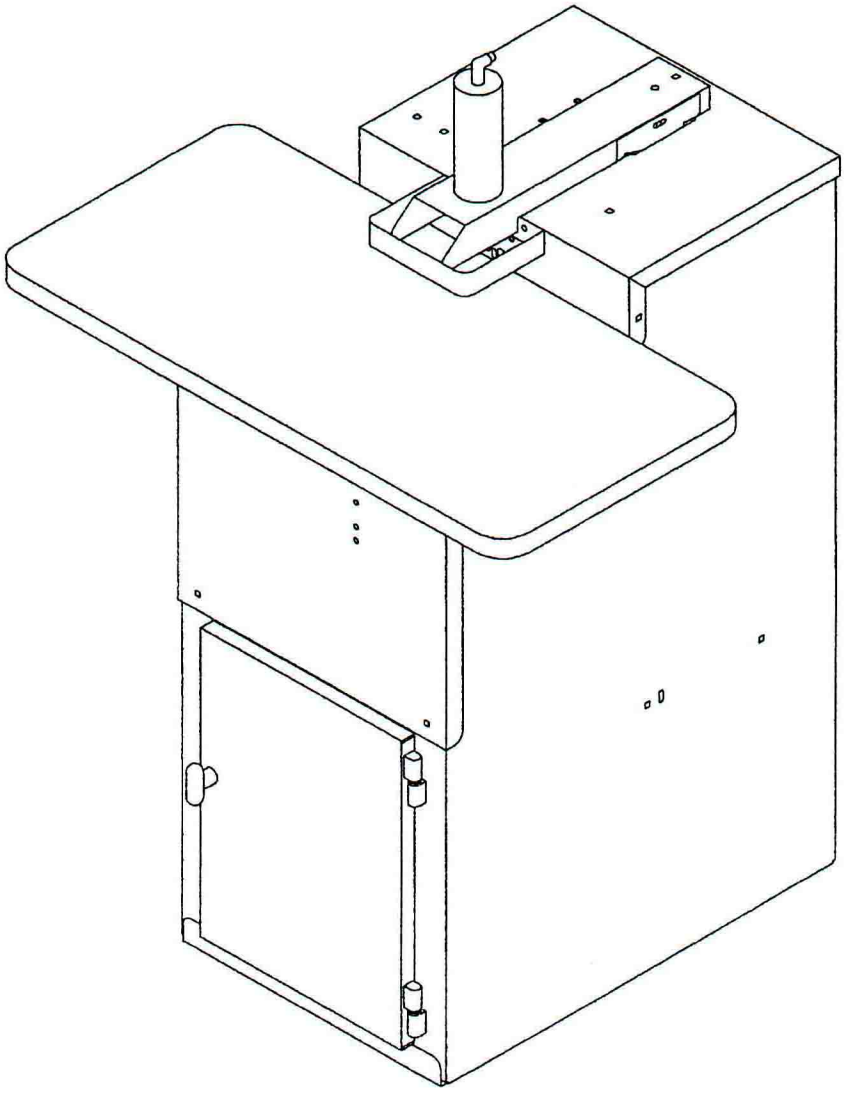
"For Models with Serial Number 61036 and Below"

Items Included with Machine

Part No.	Description	Qty
B00964	Castle 9/64 Cobalt Drill Bit w 1/4" Shank	1
B00038	Four Flute Cobalt Rough Mill 3/8" Flute	1
T10692	Wrench, Porter Cable 690	2
T47301	Wrench, Porter Cable 7301	2
B00622	Square Driver Bit, #2 x 6"	1
O00234	Bit Depth Guage	1
S90021	Operator's Manual	1
S21101	Parts List with Parts Drawings	1

NOTES:

1. SEE CASE DETAIL ON PAGE 2
2. SEE CARRIAGE DEATIL ON PAGE 3
3. SEE CONTROL BOX DETAIL ON PAGE 4



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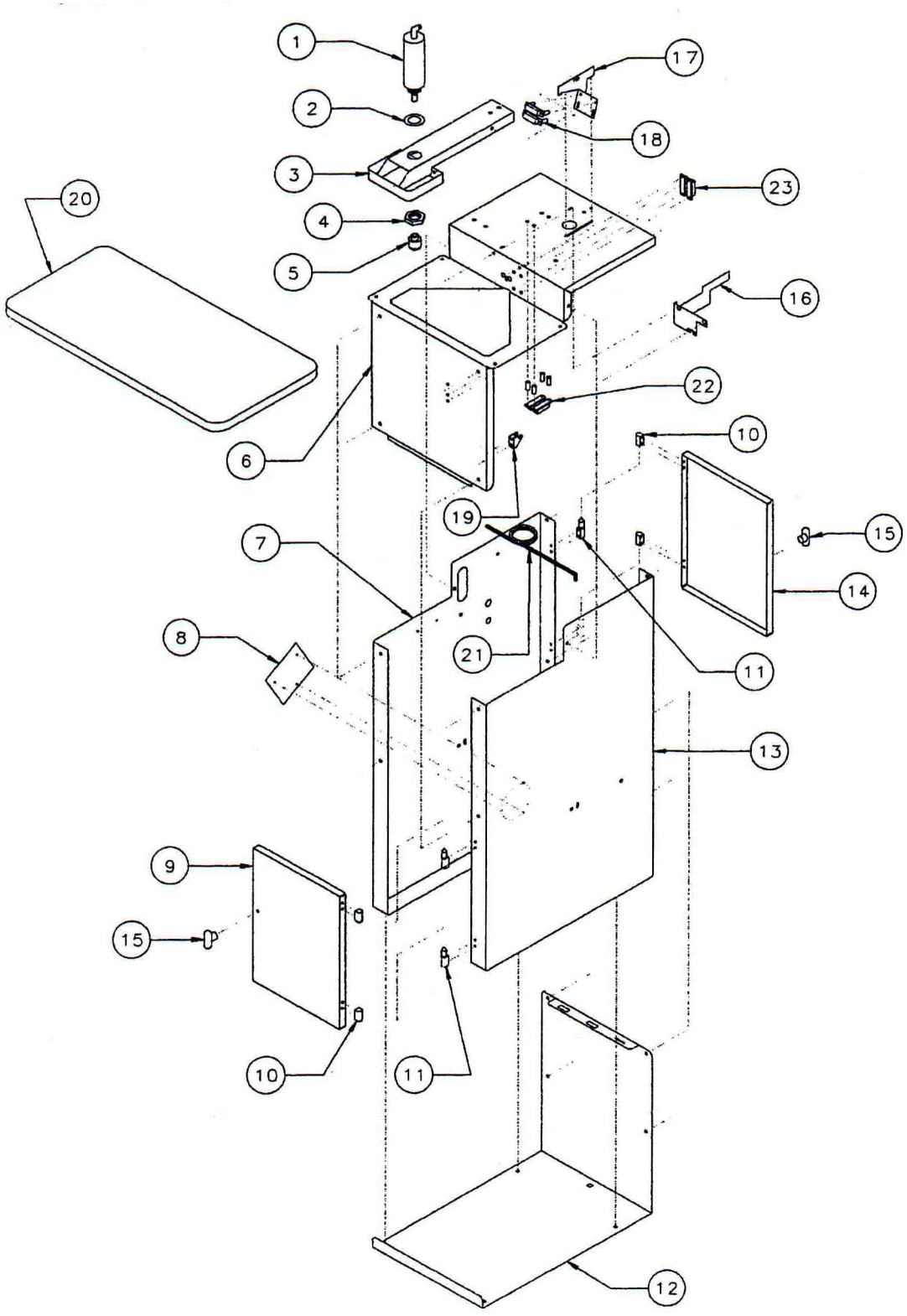
STANDARD POCKET MACHINE **1 OF 4**



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Case Assembly Detail **2 of 4**

Drawing 2 of 4 - Case Assembly

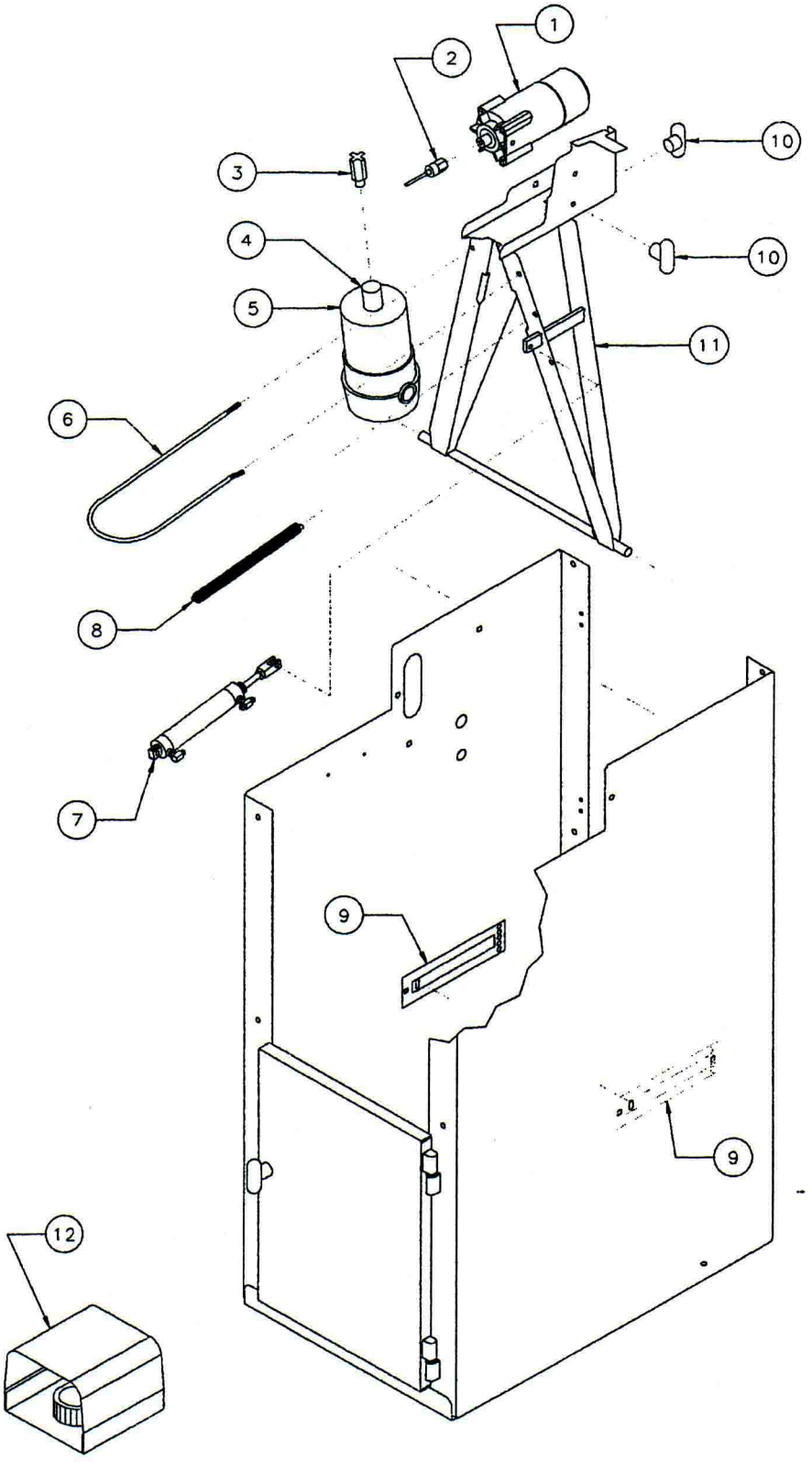
Item #	Part #	Part Description	Qty
1		**Clamp Cylinder**	
	P00215	Cylinder,Spring Return,2" Bore,1.5" Stroke,SS Rod	1
	P14414	Fitting, 1/4 NPT x 1/4 Push in Elbow	1
2	H10138	Washer, Fiber, 1-3/8 ID	1
3		**Clamp Guard**	
	M00210	Clamp Guard, Yellow	1
	F14234	Carriage Bolt, 1/4-20 x 1-3/4 ZP	1
	F14478	Scrw, Skt Hd Cap, 1/4-20 x 7/8 Bk Oxide	2
	F14202	Nut, Pem Self Clinching, 1/4-20 #2	2
	F01410	Washer, 1/4 SAE ZP	2
	F01420	Nut, Nylon Lock, 1/4-20 ZP	3
4	F11212	Nut, Hex Jam 1-1/2-12 ZP	1
5	C00200	**Clamp Foot Assembly**	
	N21351	Clamp Foot, Small Zinc Plated	1
	N70118	Pad, Polyurethane 1-1/8"	1
	F12222	Nut, Hex Jam, 1/2-20 ZP	1
6		**Case Top Assembly**	
	C00210	Face Plate	1
	U21002	Case Top, Green	1
	F14212	Carriage Screw, 1/4-20 x 1/2 ZP	4
	F14234	Carriage Bolt, 1/4-20 x 1-3/4 ZP	1
	F01420	Nut, Nylon Lock, 1/4-20 ZP	5
	F08012	Screw,PanPhillipsMachine,8-32x1/2 ZP	1
	F08032	Nut, Nylon Lock, 8-32 ZP	1
	D08320	Cable Tie Holder, Small White, Nylon	1
	S00301	Label,Warning,Keep Hands Clear,Lexan	1
	S11635	Label, Made in USA	1
	S17578	Label, Caution, "Wear Safety Glasses"	1

Item #	Part #	Part Description	Qty
7		**Case Left Side Assembly**	
	U21003	Case Left Side, Green	1
	F14212	Carriage Screw, 1/4-20 x 1/2 ZP	2
	F01420	Nut, Nylon Lock, 1/4-20 ZP	2
	S21001	Label, TSM-21 Model Number	1
	S00320	Label. Serial Number	1
8		**Dust Hole Cover**	
	M21009	Dust Hole Cover	1
	F87192	Screw,PanPhillipsMachine,8-23x3/8 ThrdCutting	3
9	M00400	Door, Front, Black W/ Logo	1
10		**Door Hinge Assembly**	2
	D00720	Hinge, Plastic, Black, Female	2
	F10241	Screw, Pan Phillips, 10-24 x 1/4 ZP	4
11		**Case Hinge Assembly**	2
	D00710	Hinge, Plastic, Black, Male	2
	F10241	Screw, Pan Phillips, 10-24 x 1/4 ZP	4
12		**Case Bottom Assembly**	
	U21001	Case Bottom, Green	1
	F14212	Carriage Screw, 1/4-20 x 1/2 ZP	4
	F01420	Nut, Nylon Lock, 1/4-20 ZP	4
	F38034	Carriage Screw, 3/8-16 x 3/4 ZP	3
	F38160	Nut, Nylon Lock, 3/8-16 ZP	3
	F12120	Washer, 1/2 SAE ZP	2
13		**Case Right Side Assembly**	
	U21004	Case Right Side	1
	F14212	Carriage Screw, 1/4-20 x 1/2 ZP	2
	F01420	Nut, Nylon Lock, 1/4-20 ZP	2

Drawing 2 of 4 - Case Assembly

Item #	Part #	Part Description	Qty
14		**Rear Door Assembly**	
	M21012	Rear Door, Black	1
	F02014	Washer, 1/4 ID x 2 OD, ZP	1
	F14212	Carriage Screw, 1/4-20 x 1/2 ZP	1
	F01420	Nut, Nylon Lock, 1/4-20 ZP	1
	S21002	Label, Wiring Diagram	1
15	C00015	**Door Handle Assembly**	2
	H00141	Bar Knob, Black Plastic, 1/4-20	1
	N00101	Spring Door Clip	1
	F14585	Screw, Hex Head Cap, 1/4-20 x 1/2 ZP	1
16	C21101	**Safety Switch Blade Assembly**	
	M21016	Safety Switch Blade	1
	F10358	Screw,Button Head Socket,10-32x7/8 Bk Oxide	2
17		**Router Stop Plate Assembly**	
	U21007	Router Stop Plate, Black	1
	F14340	Carriage Screw, 1/4-20 x 3/4 ZP	1
	F01420	Nut, Nylon Lock, 1/4-20 ZP	1
	F01410	Washer, 1/4 SAE ZP	1
18		**Router Stop Switch Assembly**	
	E10850	Actuator, Magnetic Strong and Switch, Magnetic Reed	1
	F08012	Screw, Pan Phillips Machine, 8-32 x 1/2 ZP	4
	F08032	Nut, Nylon Lock, 8-32 ZP	4

Item #	Part #	Part Description	Qty
19		**Clevis Bracket Assembly**	
	D07111	Clevis Bracket, 1/4" ZP BP11-C	1
	D14078	Clevis Pin, 1/4 x 7/8 ZP	1
	D14934	Hairpin, 1/4 ZP	1
	F14585	Screw, Hex Head Cap, 1/4-20 x 5/8 ZP	2
	F01420	Nut, Nylon Lock, 1/4-20 ZP	2
	F01410	Washer, 1/4 SAE ZP	2
20	C21006	**Work Top Assembly**	
	V21001	Top, 1" Particle Board, 15" x 31", Standard Grey	1
	H11402	T-Band, 1-1/4" Black Solid Convex	90"
	F44134	Screw,Flat Head Socket Cap,1/4-20x1-3/4 Bk Ox	4
	F01420	Nut, Nylon Lock, 1/4-20 ZP	4
21		**Bar Spring Assembly**	
	N21366	Single Coil Torsion Bar Spring	1
	M21066	Plate, Bar Spring Retainer, Egalv	1
	F14340	Carriage Screw, 1/4-20 x 3/4 ZP	2
	F01420	Nut, Nylon Lock, 1/4-20 ZP	2
22		**Safety Switch Assembly**	
	E10850	Actuator, Magnetic and Switch, Magnetic Reed	1
	F08112	Screw,Flat Head Phillips Machine,8-32x1-1/2 ZP	4
	D38507	Spacer, White Nylon, 3/8 OD x 5/32 ID x 7/8 L	4
	F08032	Nut, Nylon Lock, 8-32 ZP	4
23		**Drill Stop Switch Assembly**	
	E10850	Actuator, Magnetic and Switch, Magnetic Reed	1
	F08322	Screw,Flat Head Phillips Machine,8-32x1/2 ZP	4
	F08032	Nut, Nylon Lock, 8-32 ZP	4



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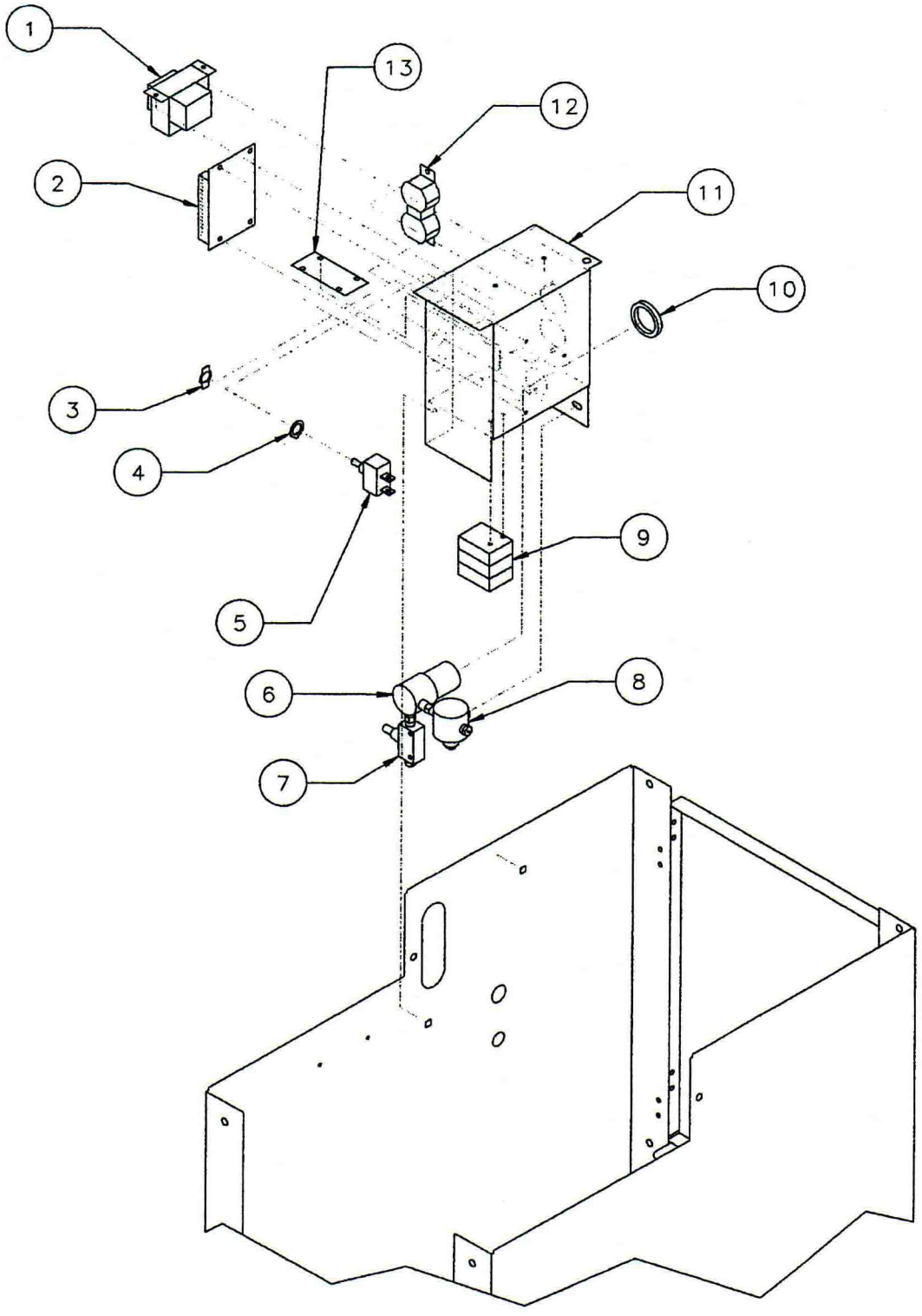
Drill & Router Carriage Detail **3 of 4**

Drawing 3 of 4 - Carriage Assembly

Item #	Part #	Part Description	Qty
1	E27301	Drill Motor, P-C #7301 Laminate Trimmer	1
2	B00964	Castle Drill Bit, 9/64 Cobalt w/ 1/4" Shank	1
3	B00038	Rough Mill, 3/8 Dia.Four Flute Cobalt-RM-38	1
4	D50038	Collet Assembly, 3/8 PC #6902	1
5	E26902	Router Motor, P-C #6902 1-1/2 HP	1
6		**Motor Mount U-Bolt Assembly**	
	N21142	Motor Mount U-Bolt, 1/4-20 ZP	1
	F01420	Nut, Nylon Lock, 1/4-20 ZP	1
	F01410	Washer, 1/4 SAE ZP	1
7	C21004	**Drive Cylinder Assembly**	
	P21306	Cylinder, 1.06 Bore x 3" Stroke, SS Rod	1
	D07130	Rod Clevis, 1/4"	1
	D14034	Clevis Pin, 1/4 x 3/4 ZP	1
	D14934	Hairpin, 1/4 ZP	1
	F51620	Nut, Jam, 5/16-24 ZP	1
	P10320	Valve, SQE 10-32 Brass	2
	P10328	Bushing, 10-32 x 1/8 NPT Brass	2
	P10316	Fitting, 10-32 M x 3/32 Barb, White Nylon	1
	P10326	Fitting, 10-32 M x 3/32 Barb, Black Nylon	1
	P10321	Fitting, 10-32 M x 1/16 Barb, White Nylon	1
	P10322	Fitting, 10-32 M x 1/16 Barb, Black Nylon	1

Item #	Part #	Part Description	Qty
8		**Extension Spring Assembly**	
	H25061	Spring, Extension, .562 OD x 8.25 L x .062 Dia. ZP	1
	D14100	Clevis Pin, 1/4 x 1	1
9		**Bearing Jack Assembly**	
	M21044	Bearing Jack, ZP	2
	F14340	Carriage Screw, 1/4-20 x 3/4 ZP	4
	F01420	Nut, Nylon Lock, 1/4-20 ZP	4
10	H00141	Bar Knob, Black Plastic, 1/4-20	2
11	C21022	**Motor Carriage Assembly**	
	U21022	Motor Carriage Weldment	1
	N03442	Bushing, 3/4" Hex Carriage Pivot, Brass	2
	F14458	Screw, Cup Point Socket Set, 1/4-20 x 1-1/4	3
	F01420	Nut, Nylon Lock, 1/4-20 ZP	2
12		**Foot Switch Assembly**	
	E00491	Foot Pedal, Linemaster 491-SC36 w/Cord	1
	E07041	Microswith for foot pedal	1
	M00235	Guard, Castle Universal Footswitch	1
	F40388	Screw, Oval Head Self-Tapping, #4 x 3/8 SS	2



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CONTROL BOX DETAIL **4 OF 4**

Drawing 4 of 4 - Control Panel Assembly

Item #	Part #	Part Description	Qty
1		**Transformer Assembly**	
	E11424	Transformer, 120V Primary, 24V Secondary	1
	D81614	Spade Lug, 16-14 AWG #8	2
	F63238	Screw, Pan Phillips Machine, 6-32 x 3/8 ZP	2
	F63260	Nut, Lock Washer, 6-32 Kep ZP	2
2		**Control Board Assembly**	
	E21024	EL-21 Solid State Control Board	1
	E21016	Terminal Strip, 16 Pin	1
	E22708	Wire, 22AWG, 2 Strand, Grey Jacketed	22"
	E22708	Wire, 22AWG, 2 Strand, Grey Jacketed	32"
	E22708	Wire, 22AWG, 2 Strand, Grey Jacketed	54"
3	H30843	Plate, Power Switch On/Off	1
4	F75702	Nut, Power Switch Mounting	1
5	E75762	Switch, Power, 30 A, 125 VAC	1
6		**Regulator Assembly**	
	P14113	Regulator, Parker, 1/4 NPT, 0-125 PSI	1
	P14918	Nipple,HexReducing,1/4 NPTx1/8 NPT Brass	1
	P25421	Nipple, 1/8 NPT Hex Close	1
	P18230	Fitting, 1/8M x 1/8 Barb, White Nylon Elbow	1
	P01418	Tubing, 1/4 OD x 1/8 ID, Black Polyurethane	2"
	P33218	Fitting, 3/32 x 1/8 x 3/32 White Barb Tee	1
	P53118	Tubing, 5/32 OD x 3/32 ID Nat. Polyethelene	2"
	P53118	Tubing, 5/32 OD x 3/32 ID Nat. Polyethelene	6"
7		**Router Speed Control Assembly**	
	P00117	Valve, Flow Control, SMC NAS-2000-N01	1
	P18132	Fitting, 1/8M x 10-32, White Nylon Bushing	1
	P10318	Fitting, 10-32 x 3/32 Barb White Nylon Elbow	1
	P53202	Tubing, 5/32 OD x 3/32 ID Black Polyethelene	6"

Item #	Part #	Part Description	Qty
8		**Pilot Valve Assembly**	
	P32012	Valve, 3-Way Pilot, Clippard #2012	1
	P18011	Fitting 1801-1 White Nylon Reducer 1/8-27 x 10/32	1
	P10318	Fitting, 10-32 x 3/32 Barb White Nylon Elbow	1
	P53218	Tubing, 5/32 OD x 3/32 ID Black Polyethelene	4.5"
	P18532	Fitting, 1/8M x 5/32 Barb, Black Nylon	1
	P18230	Fitting, 1/8M x 1/8 Barb, White Nylon Elbow	1
	P01418	Tubing, 1/4 OD x 1/8 ID, Black Polyurethane	35"
9		**Control Valve Assembly**	
	P21324	Valve, Isonic 3-Way 24 VDC	3
	P53218	Tubing, 5/32 OD x 3/32 ID Black Polyethelene	48"
	P53118	Tubing, 5/32 OD x 3/32 ID Natural Polyethelene	44"
	S12043	Spiral Wrap, 1/2" Black Polyethelene	32"
	F63212	Screw,Flat Hd Phillips,Machine,6-32x2-1/2 ZP	2
	F63260	Nut, Lock Washer, 6-32 Kep ZP	2
10	D78652	Panel Nut, Regulator Mounting	1
11		**Control Panel Enclosure Assembly**	
	M21014	Control Panel Enclosure, 14 GA Egalv	1
	F14212	Carriage Screw, 1/4-20 x 1/2 ZP	2
	F01420	Nut, Nylon Lock, 1/4-20 ZP	2
	E21143	Power Cord, 14-3 SJT w/ 3 Prong Plug	1
	D61614	Spade Lug, Vinyl, 16-14 AWG # 8	3
12		**Motor Power Outlet Assembly**	
	E05320	Outlet, Duplex	1
	E14318	Wire. 14AWG Stranded, Green	10"
	E18372	Wire, 20AWG Stranded, Red	10"
	F63238	Screw, Pan Phillips Machine, 6-32 x 3/8 ZP	2
	F63260	Nut, Lock, 6-32 Kep ZP	2
13		**Slot Cover Assembly**	
	M00130	Back Plate Slot Cover	1
	S11436	Tape, PVC Foam S/A 1-1/4"	6"
	F63210	Screw, Pan Phillips Machine, 6-32 x 1/2 ZP	4
	F63260	Nut, Lock, 6-32 Kep ZP	4