



# CASTLE, INC.



## Installation Instructions

### TSM-21 Parker Solenoid Valve Upgrade



# Table of Contents

- 1 INTRODUCTION.....4
- 2 INSTALLATION INSTRUCTIONS .....5
  - 2.1 SAFETY RULES .....5
  - 2.2 INVENTORY.....6
  - 2.3 REMOVING THE MEAD VALVES.....7
  - 2.4 REMOVING THE AIR REGULATOR ASSEMBLY.....8
  - 2.5 INSTALLING THE PARKER SOLENOIDS.....11
  - 2.6 PLUMBING THE NEW VALVES .....15
  - 2.7 INSTALL CONTROL BOX AND FINISH .....16

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# 1 Introduction

Thank you for purchasing a TSM-21 Parker Solenoid Valve upgrade. Since 1985 our goal is to manufacture and develop machines that make cabinetmaking and casework easier, faster, and more profitable for woodworking professionals. Castle machines are made in Petaluma, California and are manufactured to the highest standards using local vendors wherever possible.

The Castle model TSM-21 is designed for use on a wide variety of materials. The machine performs well in hardwoods, softwoods, melamine, particleboard and MDF. The machine will work on materials varying in thickness from  $\frac{1}{2}$ " to  $1\frac{3}{4}$ ".

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**Warning:** Do not attempt to perform maintenance or operate this machine until you have read and understand the information contained in this manual.

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## 2 Installation Instructions

These instructions are intended to illustrate how to update the control box to use Parker solenoids. At the same time components will be removed that are no longer needed.

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### 2.1 Safety Rules

The Castle Model TSM-21 Pocket Machine was designed with operator safety as a priority, which is why Castle highly recommends the following:

1. Read this Instruction Manual carefully before beginning the carriage exchange.
2. Before attempting adjustments, maintenance, or repair, turn off this machine, **disconnect** it from its power source and air supply. Wait for all motion to stop. Failure to disconnect this machine from its power source and air supply or wait for all motion to stop could result in electrocution or injury.

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## 2.2 Inventory

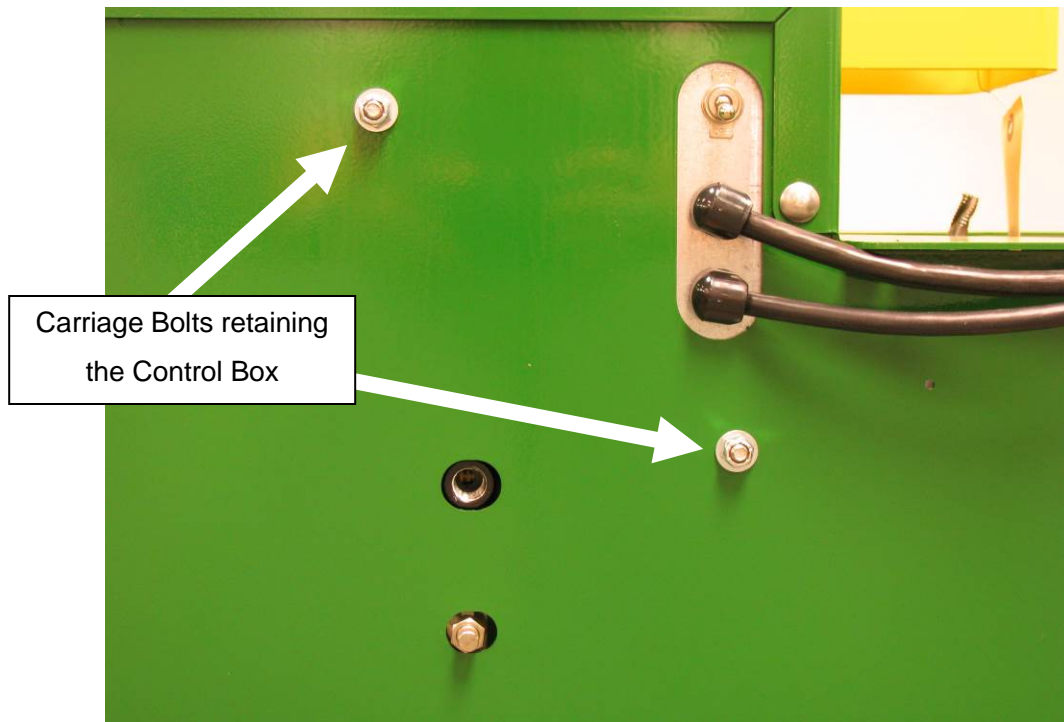
With your Castle TSM-21 Bosch Motor Carriage upgrade pack you should have received the following:

CASTLE TSM-21 Parker Solenoid Upgrade Kit		
Part #	Part Description	Qty
<b>P21224</b>	Parker 3 Way Solenoids (ready to install)	3
<b>P00535</b>	1/8 NPT x 5/32 Push In Elbow <i>(4) Installed</i>	7
<b>P14018</b>	1/8 NPT x 1/4 Push In Elbow <i>(2) Installed</i>	2
<b>P12447</b>	1/4 NPT x 5/32 Push In Elbow	1
<b>F44003</b>	4-40 x 2-3/4" Phillips Machine Screw	2
<b>F44041</b>	4-40 Kep Nut	2
<b>D10128</b>	Nylon Spacer	2
<b>H00015</b>	Control Board Supports	3
<b>P01418</b>	1/4" Black Hose – 5" piece & 45" piece	45"
<b>P53293</b>	5/32 Clear Hose – 8" piece & 46" piece	54"
<b>P53202</b>	5/32 Black Hose – 5-1/2" piece & 50" piece	56"
	Zip Ties	5

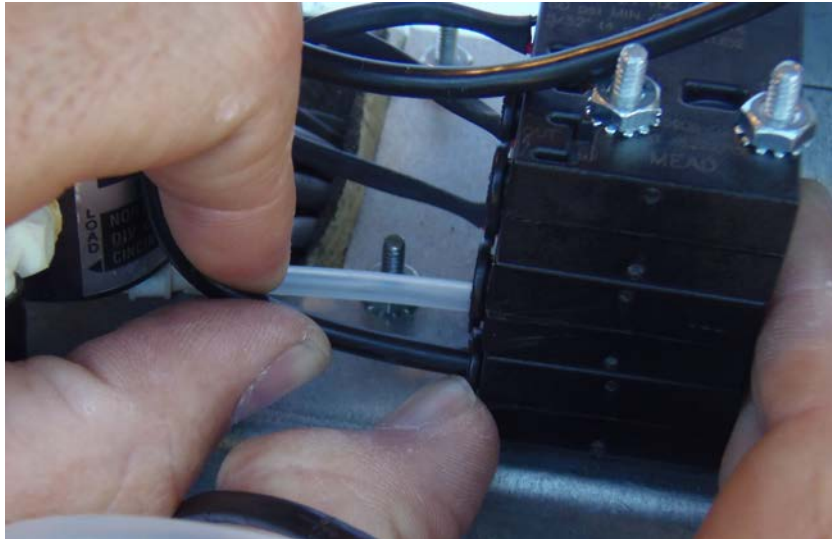
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## 2.3 Removing the Mead Valves

- Disconnect power and air from the machine.
- Disconnect the Router and Drill power cords from the AC outlet.
- Remove the two carriage bolts that hold the Control Box to the machine and pull the box partially out the rear door.



- Remove the air hoses from the solenoids by holding the locking ring with your thumb.

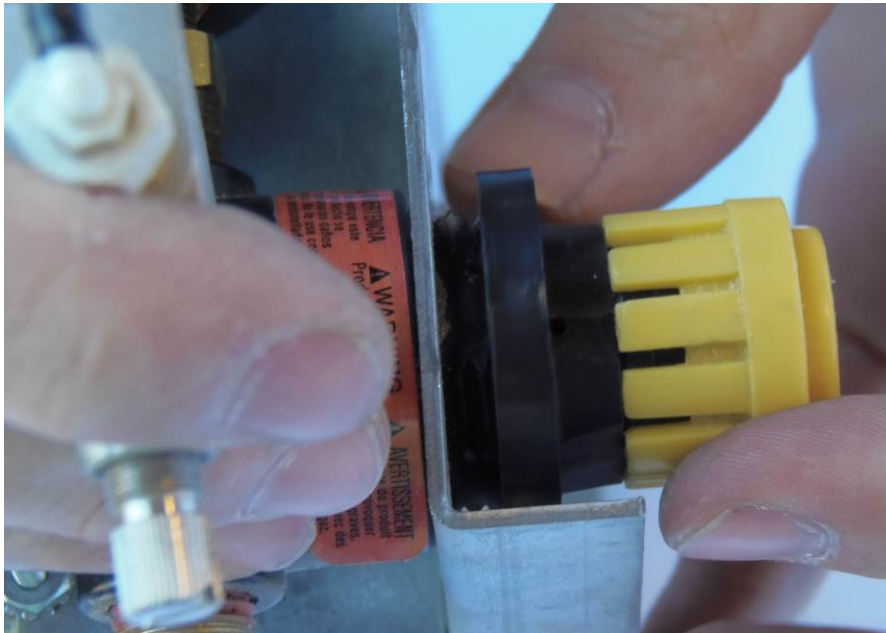


- Use a 5/16 Nut Driver or wrench to remove the nuts holding the solenoids in place.
- Slip the solenoids off the screws and let hang.
- Loosen the bottom nut with the 5/16 Nut Driver or wrench, and fully remove nut.
- Remove the screws from the interior of the control box.

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## 2.4 Removing the Air Regulator Assembly

- Loosen and remove the panel nut holding the Air Pressure Regulator in place



- Slide the entire assembly – regulator, flow control, pilot valve & hoses – out.



- Using a 9/16 wrench, loosen the fitting between the regulator and the pilot valve.



- Cut the 1/4 black hose off the pilot valve. This is the air out to the clamp.



- Discard the pilot valve.
- Remove the 1/4 black hose from the air pressure regulator.
- Remove the white plastic elbow from the flow control and replace with push in elbow fitting.



- Install elbow fitting in regulator where connecting fitting was removed.



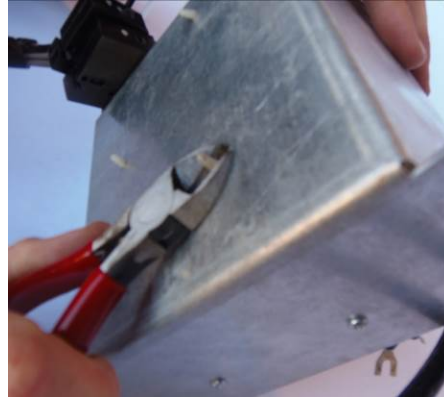
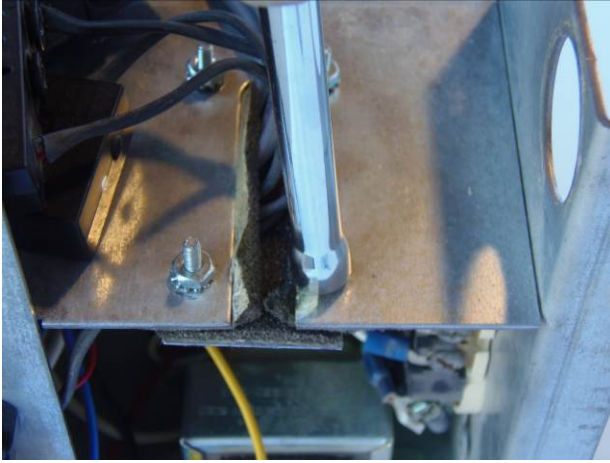
- The finished assembly should look like this:



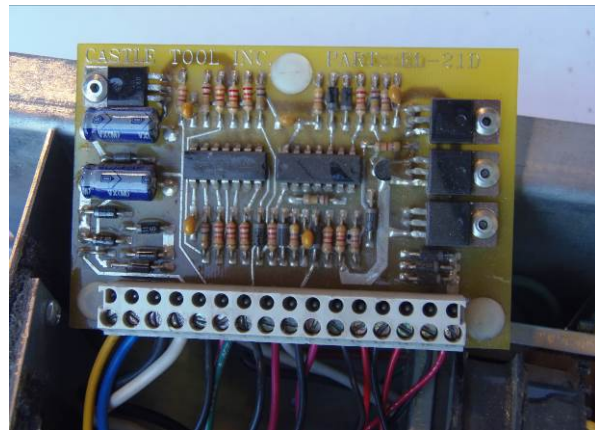
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## 2.5 Installing the Parker Solenoids

- Loosen the front nuts on the control box where the wires go through to the interior.

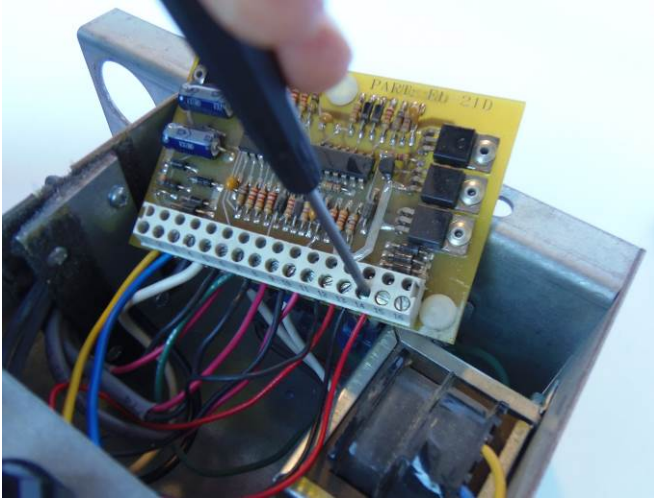


- Clip the backs of the control board stand-offs from the rear of the control box.
- Carefully reach in and pull the control board out to access the terminal strip.

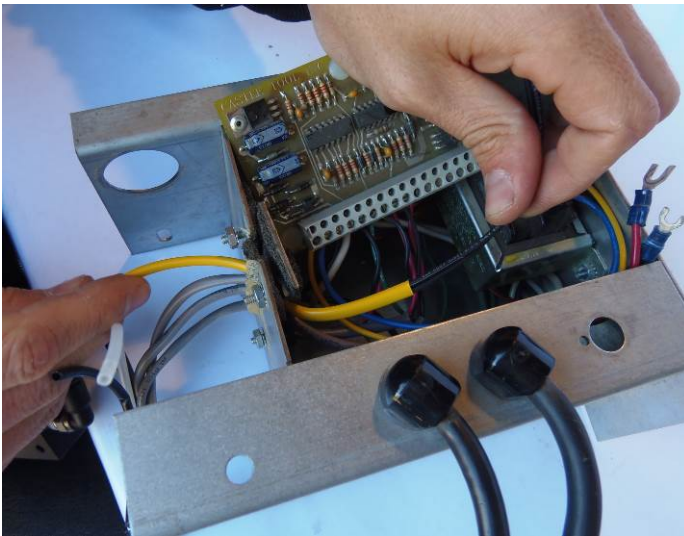




- Loosen – but DO NOT REMOVE – the screws at terminals 11 through 16.



- Pull the loose solenoid wires out of the terminal strip and the wires out of the box and discard solenoids.
- Thread the Parker Solenoid Valve wires through to the interior of the control box. The solenoids should go in order – Clamp (yellow), Router (white), Drill (black)



- Install the solenoid wires in the following terminals:
  - Clamp (yellow) – terminals 11 & 12
  - Router (white) – terminals 13 & 14
  - Drill (black ) – terminals 15&16

- To install:
  - It is not important which wire of the pair goes into the terminal; only that the pairs are together (11&12, 13&14, 15&16).
  - Place the stripped wire, but not the insulation, in the terminal underneath the plate and tighten the screw.



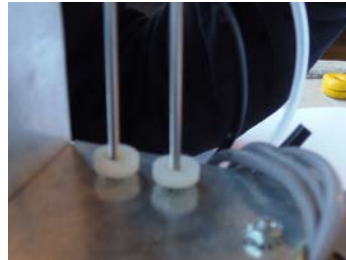
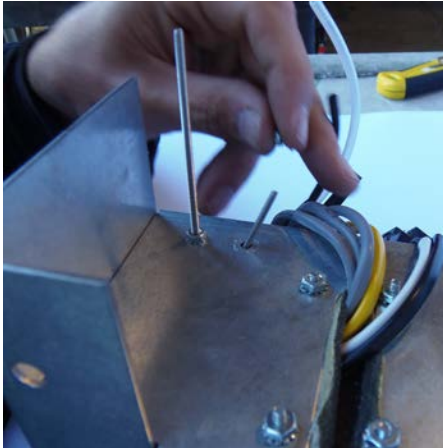
- Gently tug on the wire to confirm that it is in place
- Once the wires are installed, remove the white stand-offs from the board. Use pliers to hold the snap-in barbs flush so that the support can be pushed out through the mounting hole.
- Replace the stand-offs and make sure they are snapped into place.

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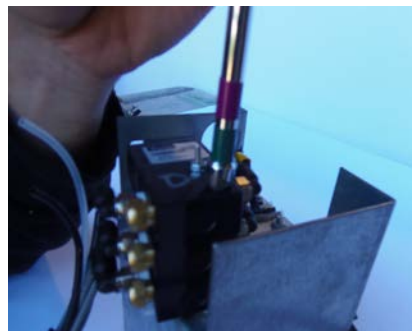
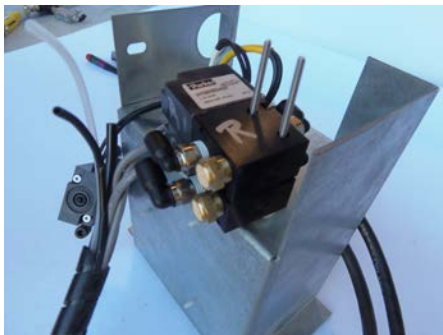
**Note:** The control board will not function if it is touching metal. It is important to install the stand-offs correctly.



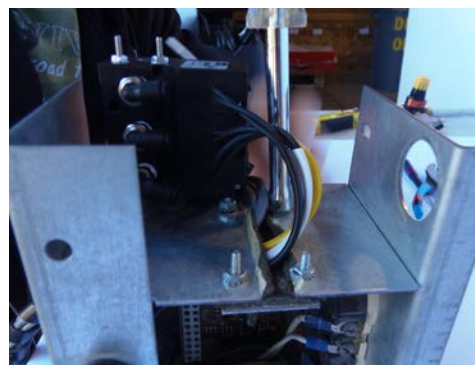
- Move the control board back into place and push the tips of the supports through the control box to lock into place.
- Install the new solenoid mounting screws by pushing through the interior of the box and tightening the kep nut against the control box.



- Slide the plastic spacers on the mounting screws.
- Slide the solenoids in place starting with the Clamp Solenoid, then Router, then Drill

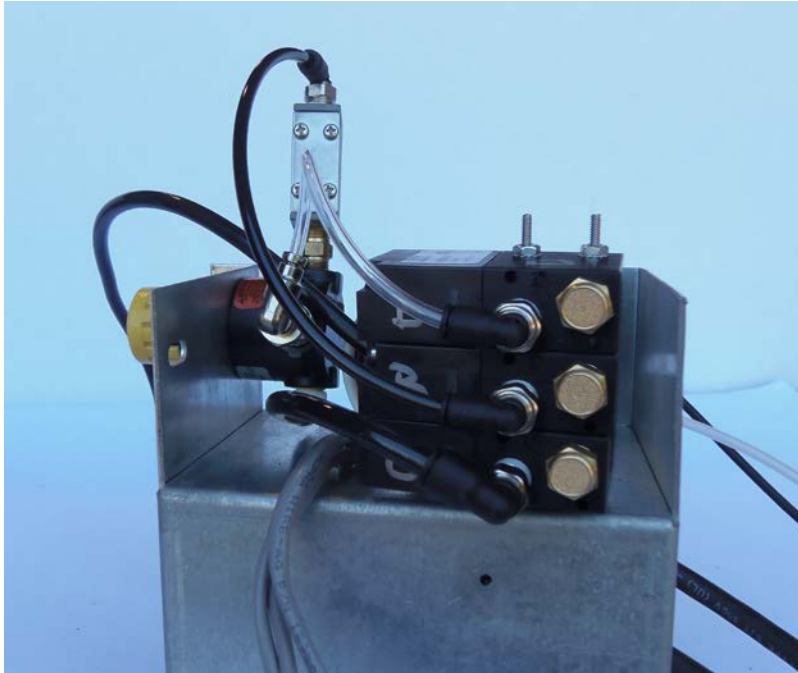


- Tighten kep nut. There is no need to over-tighten.
- Once the valves are in place, tighten the nuts on the plate that holds the wires.



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## 2.6 Plumbing the New Valves



- Replace the Main Air Pressure Regulator Assembly
- Plumb Air IN:
  - Plumb the 5" piece of black 1/4" hose from the white barb on the main air pressure regulator to the elbow on the clamp solenoid, on the side with the breather (shown).
  - Plumb the 5-1/2" piece of black 5/32" hose from the elbow on the bottom of the router feed rate valve to the elbow on the router solenoid, on the side with the breather (shown).
  - Plumb the 8" piece of clear 5/32" hose from the silver elbow on the main air pressure regulator to the elbow on the drill solenoid, on the side with the breather (shown).
- Plumb Air OUT:
  - Plumb the 45" piece of black 1/4" hose to the elbow on the clamp solenoid (opposite side from AIR IN).
  - Plumb the 50" piece of black 5/32" hose to the elbow on the router solenoid (opposite side from AIR IN).
  - Plumb the 46" piece of clear 5/32" hose to the elbow in the drill solenoid (opposite side from the AIR IN).

- Remove the work top to access the drive cylinder.
- Cut the hose from the barbs on the super quick exhaust valves and remove super quick exhaust valves from cylinder.
- Replace with 5/32 Elbow Fittings

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## 2.7 Install Control Box and Finish

- Re-Install the control box, being careful move hoses out of the way so they are not pinched.
- Remove the hose from the top of the clamp and pull the hose out of the yellow clamp guard.
- Push the new 1/4" hose up through the clamp guard and push into the elbow fitting.
- Use the zip ties included to re-attach the wiring and hose harness to the holders in the machine. Make sure to include the new 5/32" clear and black hoses, but do not over-tighten and crimp the hoses.
- Attach the hoses to the drive cylinder: Black hose closest to the case, clear hose closest to the carriage.



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**Note:** The solenoids have manual override buttons on them – black plastic push buttons on the edge closest to the regulator. You can test the plumbing by pushing each one. You only need air attached – you do not need to plug the machine in.

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