

# CASTLE, INC MORTISE MACHINE MODEL TSM-20

# **OPERATOR'S MANUAL**



Revised: October 2, 2010

## CASTLE, INC. MORTISE MACHINE MODEL TSM-20 OPERATOR'S MANUAL

#### **TABLE OF CONTENTS**

#### Page #

1.0	GETTING STARTED
1.1	Warning1
1.2	Check for Damage1
1.3	Package Contains1
1.4	Machine Requirements1
2.0	GLOSSARY OF TERMS
2.1	Carriage1
2.2	Control Panel/Limit Switches2
2.3	Drive Cylinder2
2.4	Foot Pedal and Guard2
2.5	Hold Down Cylinder & Guard2
2.6	Safety Buttons2
3.0	MACHINE OPERATION
3.2	Starting the Application
4.0	MACHINE ADJUSTMENTS
4.1	Feed Rate Adjustment3
4.2	Carriage Height Adjustment3
5.0	MACHINE MAINTENANCE
5.1	Motors4
5.2	Tooling Changes
6.0	TROUBLE SHOOTING

## 1.0 GETTING STARTED

#### 1.1 Warning

The Castle Tool Mortise Machine was designed with operator safety as a priority. DO NOT ATTEMPT TO OPERATE THIS MACHINE UNTIL ALL INSTRUCTIONS HAVE BEEN READ.

#### 1.2 Check for Damage

Your Castle Tool Mortise Machine was carefully prepared for shipment at our factory. Upon receipt at your plant, carefully inspect the machine for damage. Immediately report any damage to the freight company, your dealer, and Castle, Inc.

#### 1.3 Package Contains

Warranty Card (Must be returned for warranty activation) Operator's Manual Router Wrenches (4) Bit Gage Model TSM-20 Mortise Machine

#### 1.4 Requirements

110 V AC, 20 AMP Power Supply Air Source (80 psi minimum)

#### 2.0 GLOSSARY OF TERMS

The major components of the model TSM-20 and a brief description of their functions are as follows:

#### 2.1 Carriage

The carriage is the orange A-Frame structure inside the machine. Both the router and the drill motors are mounted to this carriage. There are also two micro switches mounted at the top of the carriage. The micro switch mounted towards the rear of the machine stops the travel of the carriage during its routing cycle and starts the drilling cycle. The micro switch mounted towards the front of the machine stops the travel of the carriage during the drilling cycle.

#### 2.2 Control Panel/Limit Switches

The control panel is the box that is mounted on the left side of the machine, when viewed from the front. It houses the power switch, speed control and air input port. Inside the machine mounted on the back of the control panel are two micro switches. The micro switch at the top of the control panel tells the machine when it is in the neutral position (no bits are out). The micro switch on the bottom of the control panel is triggered by the safety buttons at the face of the machine. If those buttons are not depressed or if they fail to trigger this switch, the food pedal will have no effect on the machine.

#### 2.3 Drive Cylinder

The drive cylinder is the long narrow cylinder that is connected between the carriage and the inside front portion of the machine. The drive cylinder moves the carriage towards the rear of the machine on the routing stroke and towards the front of the machine on the drilling stroke.

#### 2.4 Foot Pedal and Guard

The foot pedal is mounted inside the orange guard to prevent accidental cycling of the machine. The foot pedal when depressed will start the cycling of the machine only when the safety buttons are pushed.

## 2.5 Hold Down Cylinder and Guard

The large cylinder and yellow bracket located on top of the machine. The hold down cylinder acts as a clamp during the machines cycle preventing material shift during cycling. The hold down guard helps to safeguard against accidentally contacting moving parts.

## 2.4 Safety Buttons

The two allen head bolts protruding slightly on either side of the drill hole at the front of the machine. The material to receive the Castle Pocket must fully depress at least one of these buttons before the machine will cycle.

#### 3.0 MACHINE SETUP & OPERATION

Now you're ready to get started with your Castle TSM-20 machine.

- 3.0.1 Check that the power switch is in the "OFF" position.
- 3.0.2 Check that the carriage is in the neutral position. Neither the router bit nor the drill bit should be protruding from the machine.

3.0.3	Place the foot switch in front of the machine in an accessible, safe location.
3.0.4	Connect the machine to a clean air supply. It is strongly recommended that an inline
	filter/water trap be used. The Model TSM-20 has internal air pressure regulator that is
	preset to 80 psi. 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.
3.0.5	Place the material in which you will cut a Castle Pocket under the hold down cylinder
	and firmly push the material against the face of the machine. Position the material so that
	the desired pocket location is centered under the hold down cylinder guard.
3.0.6	Turn the power switch to the "ON" position.
3.0.7	Press and release the foot switch to activate a pocket cycle. When the cycle has been
	completed the clamp will automatically release the material unless pressure is maintained
	on the footswitch.
3.0.8	In the event the machine fails to function properly, refer to the "Troubleshooting" section
	of this manual or call your dealer or Castle, Inc. for assistance.

#### 4.0 MACHINE ADJUSTMENTS

The Castle, Inc. Model TSM-20 was designed to be used on a wide variety of materials. You will find that the machine performs equally well in hardwoods or pressboard materials and in thicknesses from  $\frac{1}{2}$ " to  $\frac{3}{4}$ ".

#### 4.1 Feed Rate Adjustment

When switching between materials of different density it may be necessary to adjust the 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 to the left of the power switch on the outside of the control panel. Rotating the knob clockwise slows the router feed rate, and rotating it counter clockwise increases the router feed rate.

#### 4.2 Carriage Height Adjustment.

The carriage height as set at the factory will perform well in almost all material thicknesses. However you may find it useful on occasion to raise or lower the carriage thereby changing the depth of the pocket and location of the pilot hole. For example when mortising  $\frac{1}{2}$ " thick material it may be necessary to lower the carriage to prevent the router bit from cutting through the top surface of the material. Conversely, when cutting a pocket in material thicker than one inch, raising the carriage will relocate the pilot hole exit point closer to the center of the material.

- 4.2.1.1 Loosen the bolts that are threaded into the brass carriage bearings
- 4.2.1.2 Remove the bolts at the rear of the carriage bearing jacks.
- 4.2.1.3 Raise or lower the carriage bearing jacks to the desired height.
- 4.2.1.4 Reinstall and tighten the rear bolts in the holes closest to the desired position.
- 4.2.1.5 Tighten the bolts that are threaded into the brass carriage bearings

4.2.1.6 Check that the drill bit is centered on the hole in the face of the machine and that there are no interference problems before operating the machine.

#### 5.0 MAINTENANCE

The Model TSM-20 requires very little maintenance. However, to ensure productivity and longevity of your Castle, Inc. Pocket Machine it is essential that a few simple steps are followed. How often these steps are to be performed is directly proportional to the amount of hours the machine is operated each day. As a general rule operators should get in the habit of visually checking the machine at lease prior to the start of each shift.

#### 5.1 Motors

The TSM-20 uses two Porter-Cable motors (models 3102 and 6902). Because of the enclosed environment that these motors are functioning in, it is important that the maintenance guidelines provided in the Porter-Cable instruction manuals are strictly adhered to. Periodically – at least once per hour of operation – blow out all air passages on both motors with compressed air. CAUTION: ALWAYS WEAR SAFETY GLASSES WHILE USING COMPRESSED AIR!

Note: To prolong motor life and to avoid costly down-time it is strongly recommended that a dust collection system be used. A port on the left side of the machine has been provided for this purpose.

#### 5.2 Tooling Changes

Before attempting to service any part of the TSM-20 ensure that the power switch is in the "OFF" position, the machine is not plugged in and air is disconnected from the machine.

#### 5.2.1 Router Motor (Porter-Cable #6902) Removal

- 5.2.1.1 Unplug both motors from the control board.
- 5.2.1.2 Note the position of the power switch and power cord prior to removal of the motor. It is imperative that the power switch and cord are placed in the same position when reinstalling.
- 5.2.1.3 Loosen the lever nut located on the left hand side as seen from the rear of the machine of the carriage at the front of the steel sleeve that holds the motor. Be sure to hold the base of the motor with one hand as it will slide down as the pressure is released.
- 5.2.1.4 Replace the router bit following the Porter-Cable router instruction manual provided.
- 5.2.1.5 Using the Bit Gage provided set the gage on top of the collet nut and adjusts the bit height so that the top of the bit is even with the line marked with the "R".
- 5.2.1.6 Reinstall the motor in the reverse order of the above taking care to insure that the motor is inserted fully into the motor sleeve.

#### 5.2.2 Drill Motor (Porter-Cable #3102) Removal

- 5.2.2.1 Unplug both motors from the control board.
- 5.2.2.2 Loosen the "T" Handle located near the top of the carriage to the left looking in from the rear of the machine of the drill.
- 5.2.2.3 While grasping the motor at its base, pull the motor out.

- 5.2.2.4 Replace the drill bit in accordance with the Porter-Cable instruction manual with the following exceptions.
- 5.2.2.4.1 Insert the drill bit into the brass bushing (Castle PN MT04)
- 5.2.2.4.2 Place the aluminum bit gage on top of the collet nut.
- 5.2.2.4.3 Adjust the depth of the drill bit so that the tip of the bit is aligned with the line marked "D".
- 5.2.2.5 Reinstall the motor making certain that the motor is all the way forward against the motor mount and pulled down in the motor saddle.

## 6.0 TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	<b>POSSIBLE SOLUTION(S)</b>
Nothing happens when power switch is turned on.	✓ No Power	✓ Verify machine is plugged in
		<ul> <li>Check power source</li> </ul>
Machine does not cycle when	$\checkmark$ Safety buttons not	✓ Push material against
foot pedal is depressed	depressed	safety buttons
	✓ No air supply	✓ Connect to air
Clamp comes down but machine	✓ Flow control closed	✓ Open flow control
does not cycle	✓ Router not running	✓ Plug in router
		$\checkmark$ Turn on router
Machine routs pocket but does	✓ Drill motor not running	✓ Plug in drill motor
not drill hole and clamp does not	✓ Drill motor over	$\checkmark$ Turn on drill motor
release	tightened	✓ Loosen "T" handle –
	)	check for damage
Pilot hole does not go through to	✓ Pocket is not cut far	<ul> <li>✓ Adjust router stop switch</li> </ul>
pocket	enough	and /or router stop bolt
	$\checkmark$ Drill bit not set at correct	✓ Reinstall drill bit using
	depth	bit gage
Machine routes and drills but	✓ Low air pressure	✓ Check line pressure
does not finish cycle	-	✓ Check internal regulator