

# Norfield

MANUAL AND PARTS LIST

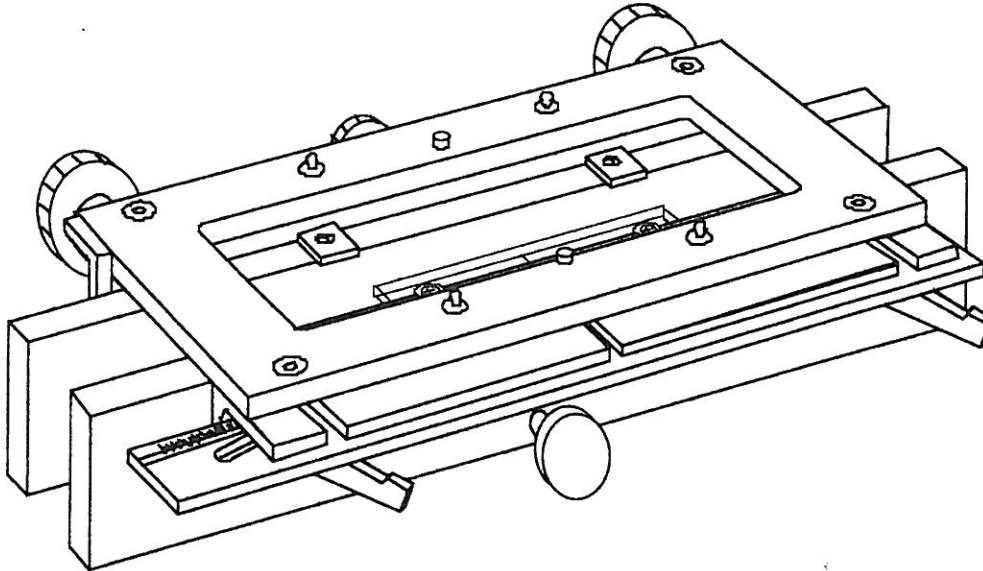
## **Doortech** **RTS-4** Instructions 17-041



# RTS-4 INSTRUCTIONS

Thank you for purchasing the DoorTech RTS-4. You can now machine for hinges, strike plates, flushbolts, pivot hinges, latch mortises, and any other mortise on the edge of a door. Each mortise pattern has its own precisely machined and clearly labeled template. The templates locate accurately on the RTS-4 with a quick snap in action. The phenolic templates will not wear out, and can be stored neatly. Small size and compact templates make the RTS-4 the right choice on the job site as well as in the shop.

The RTS-4 is a precision tool. To get the most out of it, *please read these instructions fully before use. Do not over tighten the knobs on the RTS-4. Overtightening may cause misalignment of the template on the door and, over time, will damage the screw threads.*

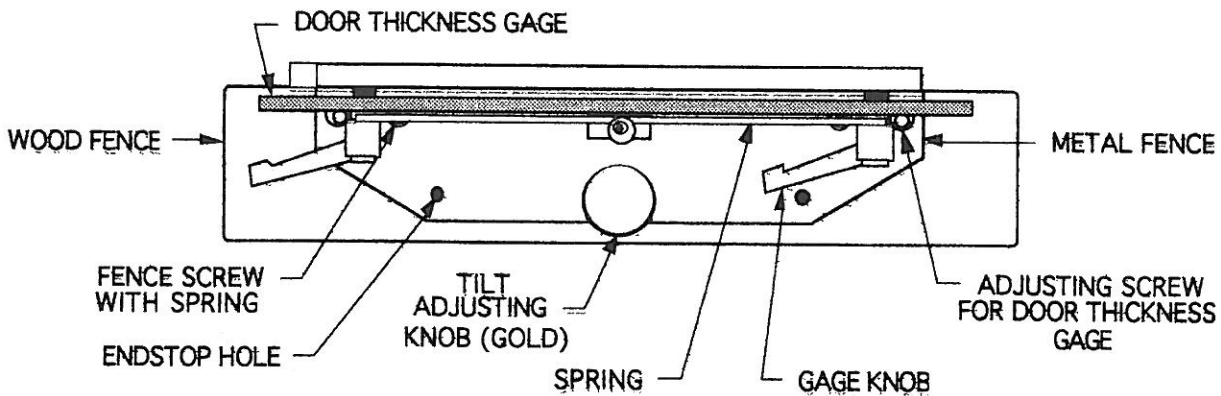
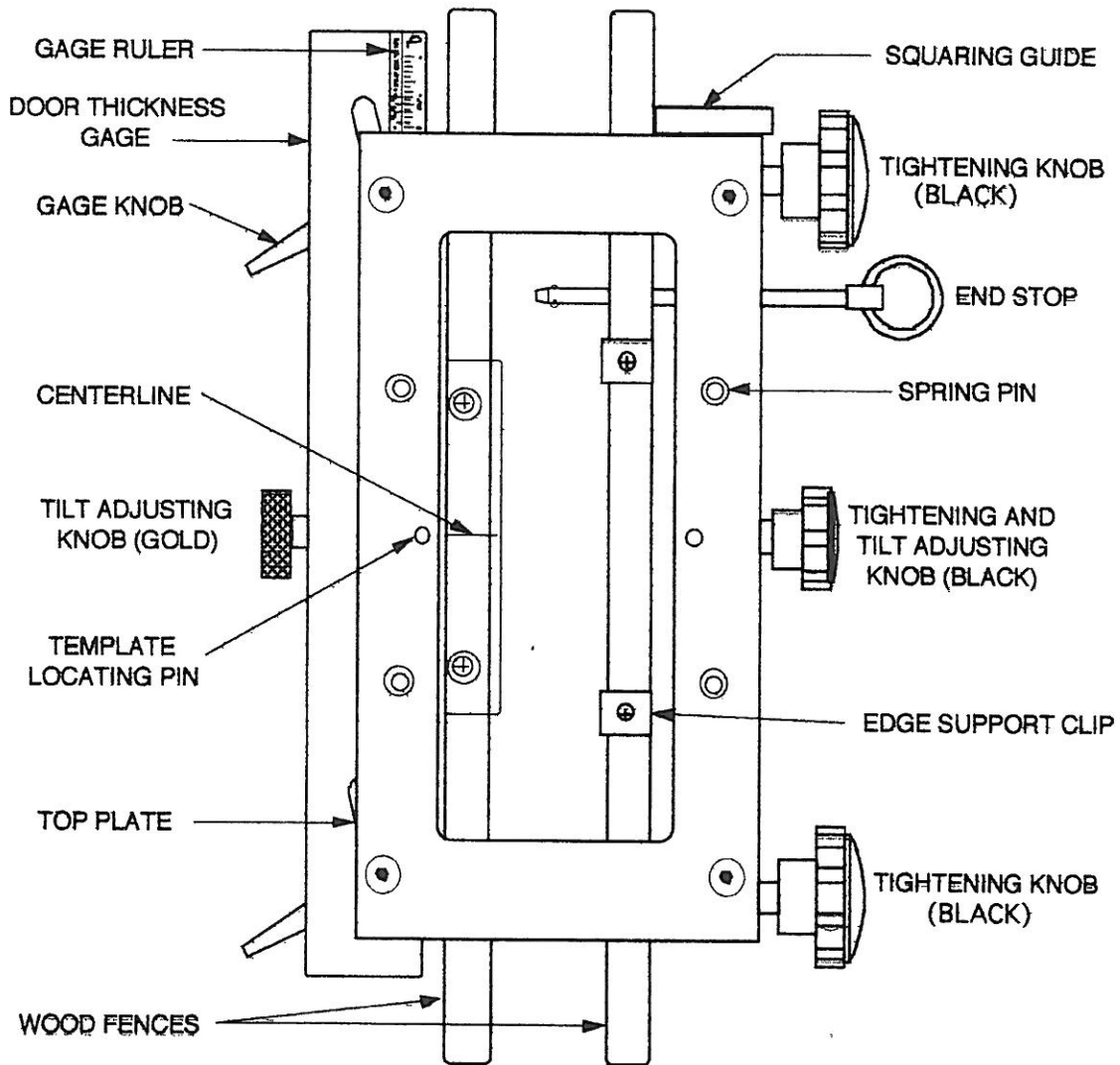


## CONTENTS

RTS-4 Base Unit Parts .....	2
RTS-4 Tool Requirements .....	3
Template Labels .....	4
Templates and Automatic Depth Control .....	4
Template Dimensions .....	5
Routing Square on a Beveled Edge .....	5
Base Tilt Adjustment .....	6
Using the endstop .....	6
Putting Templates On and Off .....	7
Setting the Router Depth of Cut .....	7
Routing the Wood Fence of the RTS-4 .....	7
Step by Step Instructions for Use.....	7
Problem Solving tips .....	9
<b>Appendix</b> Calibration of the door thickness gage ....	11
RTS-4 Parts Breakdown .....	12

**GAGE SIDE**

**FREE SIDE**



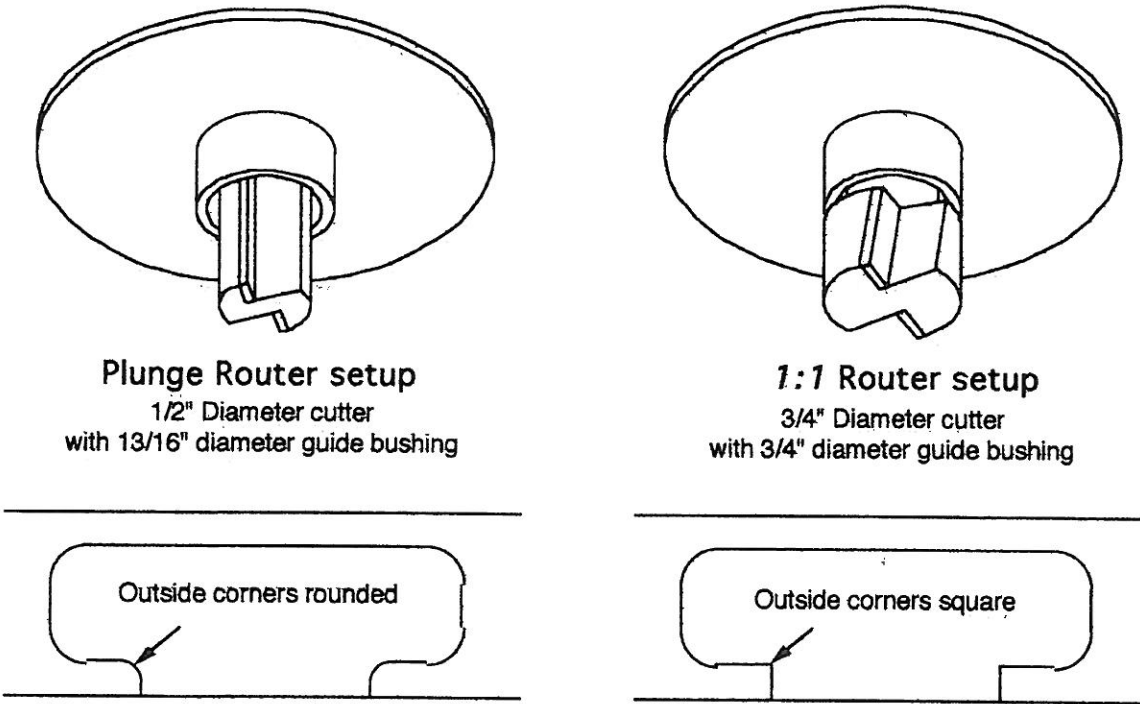
**RTS-4 TOOL REQUIREMENTS**

The *RTS-4* uses 2 standard styles of templates and requires 2 standard router setups, the *1:1 Router* and the *Plunge Router*. The DoorTech part numbers for router guide bushings and cutters are listed below.

- 1:1 Router** (Porter Cable 6902 or equivalent) equipped with:
  - 3/4" Dia. x 3/8" Guide Bushing ..... DT-G34P
  - 3/4" Dia. Carbide Cutter ..... DT-B750
  - 1/2" Dia. x 2-3/8" Arbor ..... DT-80SAF

- Plunge Router** (Elu 3337 or 3338 or equivalent) equipped with:
  - 13/16" Dia. Guide Bushing ..... DT-G1316P
  - 1/2" Dia. x 4 1/2" Twin flute carbide router bit ..... DT-B500

Figure 2 illustrates the router guide bushing and cutter setups. The *1:1 Router* is so named because that is the ratio of the diameter of the guide bushing to the diameter of the cutter. The *1:1 Router* allows you to cut square outside corners in a single pass, as shown at the bottom of figure 2.



*Figure 2. Comparison of plunge router and 1:1 router setups and cuts.*

## TEMPLATE LABELS

Each template has a label, figure 3, with the following information:

- 1 Number      The *DoorTech* Template number
- 2 Depth      The depth of cut
- 3 Name      A descriptive title
- 4 Size      Width and length of the mortise
- 5 Orientation      END      with arrow pointing toward the corner of the door  
                                 CENTER      with arrow pointing toward a centerline you must mark on the door  
                                 TOP      with arrow pointing toward the top of the door
- 6 Ruler type      Templates with a ruler identifier are placed on the *RTS-4* with the ruler arrow pointing to the door thickness gage. The ruler on the template indicates which scale to use on the door thickness gage ruler, and may also indicate the gage ruler setting to be used.
- 7 **Route square on beveled edge**      Described on page 5.

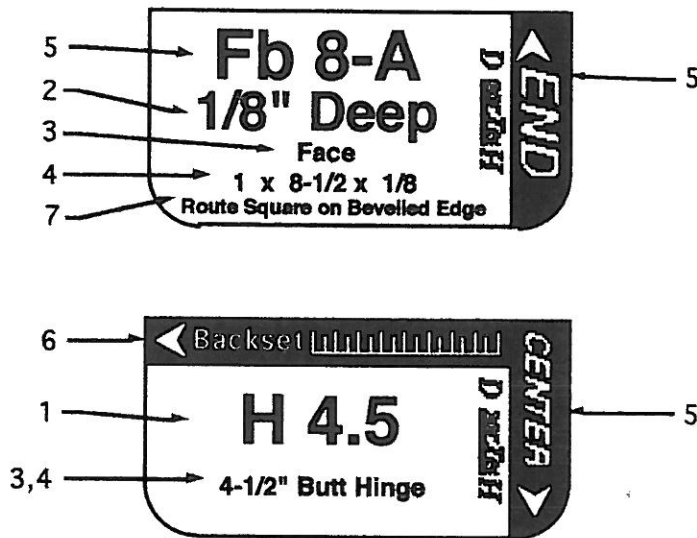


Figure 3. Template Labels

## TEMPLATES AND AUTOMATIC DEPTH CONTROL

DoorTech templates for use with the **1:1** Router are identified with the **1:1** label, figure 4. The **1:1** templates are used for mortises up to  $7/32$ " deep. The thickness of the **1:1** templates sets the depth of cut, so that the depth setting on the **1:1** Router need be set only once. This is DoorTech's Automatic Depth Control. Templates without the **1:1** label are used only with the plunge router.



Figure 4. 1:1 Label

## TEMPLATE DIMENSIONS

The actual sizes of some templates differ from those stated on the template label as follows:

- Some plunge router templates are made a fraction narrower because plunge routers tend to cut a little oversize on deep cuts.
- Most cast pivot hardware differs from the nominal dimensions, and templates are patterned on actual hardware samples whenever possible. The dimensions on the labels are those shown on the manufacturer's template drawings.
- Top and bottom pivot templates are cut  $1/32$ " longer than nominal at each end to give the installer some adjustment room.

## ROUTING SQUARE ON BEVELED EDGE

Some mortises, such as the face mortises on an corner mounted flush bolt, are routed square into a beveled edge as shown in figure 5. Templates intended for this use have "**route square on beveled edge**" written on the label, figure 3. The depth of cut is measured from the centerline of the door edge. **1:1** templates have their thickness adjusted so that the **1:1** Router will cut the stated depth when the base unit is set on a  $1-3/4$ " thick door with a 3 degree bevel. The depth of cut for the plunge router must also be set from the door centerline. The squaring guide, figure 6, is used to ensure that the base unit is square to the door faces.

A mortise cut square on a beveled edge is  $1/16$ " deeper than nominal.

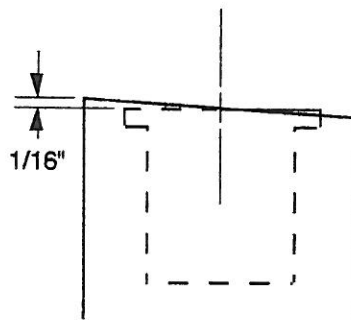


Figure 5. Routing square on a beveled edge. The depth of cut is measured from the centerline of the door.

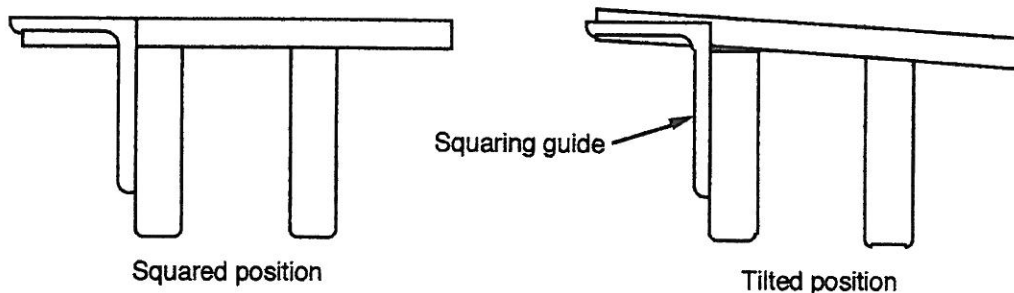


Figure 6. The squaring guide is used to set the base unit square to the door face when the door edge is beveled.

## **BASE TILT ADJUSTMENT**

The *RTS-4* base is designed to tilt so that it may lay flat against either a square or beveled door edge. The brass colored knob in the center of the gage side sets the base tilt. The gage side of the base always goes on the inside, or narrow, face of the door. The following steps describe how to adjust the tilt.

- (1) Set the door thickness gage and tighten the two gage knobs (green handles). Place the *RTS-4* on the edge of the door.
- (2) Snug up the three black knobs. Look at where the base unit's top plate sits in relation to the **squaring guide**.
- (3) Back off the two large black knobs until the tilt of the base can be adjusted easily with the two center knobs.
- (4) Adjust the 2 center knobs until the base has the desired tilt. Tighten the 3 black knobs in the following **standard sequence**:

- Standard sequence**
- 1) Tighten all 3 black knobs lightly.
  - 2) Tighten the 2 large black knobs fully.
  - 3) Tighten the small black knob fully.

***Do not overtighten.** Overtightening causes misalignment of templates, incorrect base tilt, and damages the threads.* Tightening in the standard sequence helps ensure consistently accurate mortise location on the door as well as consistent base tilt without having to readjust the gold colored tilt adjustment knob.

- (5) Repeat steps (3) and (4) until the base has the desired tilt after all 3 black knobs have been tightened in the standard sequence.

If the base is overhanging the end of the door, tighten the knob on the overhanging end less than normal.

## **USING THE END STOP**

The end stop positions the *RTS-4* base unit when using templates that are located at the END of the door (See Template Labels section above). Insert the end stop at one end of the base, and fully through both fences. Place the base on the door overhanging the door end. *For hardware that wraps around the corner of the door, keep the gage side of the base on the inside, or narrow, face of the door.* Slide the base until the end stop is tight against the door edge. The overhanging end of the base is now supported by the two edge support clips and the centerline (see Figure 1).

Adjust and tighten the base in the standard sequence described above. The large black knob on the overhanging end should be tightened less than the others. *If there is a deep mortise being routed through the end of the door (like the pocket of an automatic flush bolt), back off the large knob on the overhanging end of the base until it just lightly secures the fences against the door.* Normal tightening pressure pushes the door faces together as the core is removed, and causes the mortise to be routed too wide

## **PUTTING TEMPLATES ON AND OFF**

Set the template loosely over the locating pins. Press the template evenly downward with both hands or slap it evenly down with your palm. It should rest fully against the surface of the base unit.

To remove the template, hold down an end of the template that is at least 3" away from the center locating pins and lift evenly from the opposite end. Do not lift from the side. The phenolic material is very strong and should last indefinitely, but it is not as strong as the hardened steel locating pins. If the templates are lifted off with a strong tilt, the pins will deform the locating holes.

## **SETTING THE ROUTER DEPTH OF CUT**

You must read through the sections on setting up the base unit and using templates before setting the cutting depths of the routers.

To set the depth of cut on the **1:1** Router, place the *RTS-4* base on a practice door and adjust it so that the top plate fully contacts the door edge. Choose a **1:1** template that does NOT have "*route square on beveled edge*" written on the label. Place the template in the base and adjust the depth of cut of the router until it matches the depth stated on the label.

The plunge router is used on all templates that do not have the **1:1** label. The template label specifies the depth of cut except when the depth varies for different applications. Follow the instructions for setting depth of cut provided by the manufacturer of your particular plunge router. When setting the router depth for a mortise that sits square on a beveled edge (such as an automatic flush bolt pocket) measure the depth from the centerline of the door edge, figure 5.

## **ROUTING INTO THE WOOD FENCE OF THE *RTS-4***

Hardware such as lipped strikes, leaf hinges and offset pivot hinges require that the mortise in the door edge extend through the face of the door. It is unavoidable that one of the wood fences on the *RTS-4* must also be routed into. The gage side fence holds the center line, and should not be routed into. Only the free side fence should be routed into. The utility of the *RTS-4* is not affected unless the edge support tabs cannot be reattached.

The gage side of the *RTS-4* goes on the narrow face of the door. The narrow face is the face against the door stops, and away from the hinge knuckles.

## **STEP BY STEP INSTRUCTIONS FOR USE**

### **Step 1. Set the door thickness gage**

Place the *RTS-4* on a table with the gage side facing you. Loosen the 2 gage knobs (green). Slide the gage all the way to the left (maximum opening), and then slide it in until the desired dimension on the ruler aligns with the edge of the tool. Tighten the 2 gage knobs; over-tightening is not required.

### **Step 2. Adjust the base tilt (described on page 6).**



**Step 3. Position the base on the door**

Place the *RTS-4* on the door with the gage side on the narrow face of the door.

For hardware which locates to a center line, mark the center line of the hardware on the door edge and square across. Align the base unit's center line with your mark.

For hardware which locates to a door corner, use the end stop. Be sure that the base unit is supported on the door edge by the metal support clips and/or the plastic centerline, and that the end stop is tight against the door.

**Step 4. Adjust the base tilt and tighten the base on the door**

Adjusting the tilt is described on page 6. Be sure that the gage knobs are tightened first. Tighten the 3 black knobs lightly. Check that the edge support clips and the centerline are on the door edge, and not pressing against the door face. Now tighten the 2 large black knobs and then the small black knob. *DO NOT OVER TIGHTEN*. Over tightening causes misalignment and premature wear of the clamp screws.

**CAUTIONS:**

- a) *If a deep cut will be made through the end of the door, then the large knob on the overhanging end should be tightened only until the base is just snug against the door and no more.*
- b) *Do not loosen the gage knobs while the black knobs are tightened.*
- c) *Do not tighten the black knobs while the gage knobs are loose.*

**Step 4. Select the correct template and orient it on the *RTS-4*.**

Check all of the label information. Make a test cut if unsure. A label marked "CENTER" has an arrow pointing towards the *RTS-4* center line. A label marked "END" has an arrow pointing towards the *RTS-4* endstop. A label marked "TOP" or "BOTTOM" has an arrow pointing towards the top or bottom of the door. A label with a ruler icon has an arrow pointing toward the door thickness gage. Orient templates with cuts through the face of the door such that the router will cut into the wood fence of the *RTS-4* on the free side of the tool.

**Step 4. Snap in the template**

Follow the instructions on page 4 for locating and removing templates. Do not allow dust to collect and remain under the template because it will affect the depth of cut.

**Step 5. Route****Step 6. Lift off the template**

Follow the instructions on page 4 for locating and removing templates. If more than one template is required at a single location, leave the base unit clamped in position while switching the templates.

**Long Mortises**

Very long mortises may require that the *RTS-4* be moved along the door. It is convenient to make a mark on the door edge measured from the end of the *RTS-4* top plate, and move the *RTS-4* until the top plate aligns with the mark. The distance of the mark from the end of the top plate is the same as the distance that the template is required to move.

## **PROBLEM SOLVING TIPS**

<b><u>Problem</u></b>	<b><u>Reason</u></b>	<b><u>Solution</u></b>
Mortise too large	Router guide collar loose	Tighten the guide collar.
	Guide collar too small or router bit too large	Replace the guide collar or the router bit.
	Base not clamped or clamps not adjusted tight enough	Tighten the base knobs and readjust if needed.
	Bit not set deep enough into router	Use a longer bit
	Router guides or bearings worn	Rebuild or replace the router.
Mortise too small	Bit made smaller by sharpening	If bit is slightly off-center in the collar, try repeated routing after rotating the router base. Otherwise, replace the bit.
<i>1:1 Router</i> cut not aligned with plunge cut	Bits are not on center within guides (This is very common)	Determine the orientations for both routers in which their cuts will coincide. Mark the router <u>bases</u> appropriately.
Mortise too deep	Incorrect template	Be sure correct depth is printed on the template label.
	Bit not adjusted or slipped down	Tighten the bit and readjust depth.
	Edge support clip missing, loose or not resting on highest face of the door edge	If using the end-stop, be sure edge support clips are firmly attached to the wood fence and are resting on the highest face of the door edge.
	Plastic centerline	If using the end-stop, be sure the plastic centerline is firmly attached to the wood fence.
Mortise is 1/16" too deep on Flush bolt faces	Flush bolt faces for FB356, FB556, FB8 and others cut 1/16" deeper than stated if used on a square edge door.	Set the base square and put on a beveled edge and the cut will <u>average</u> the stated depth. Look for the phrase "Route square on beveled edge" on the label. If the door edge is square, shim under the template or the router. Templates correctly thickened for square edged doors can be special ordered.

<u>Problem</u>	<u>Reason</u>	<u>Solution</u>
Mortise too shallow	Base not well seated on door edge	Loosen knobs and press down on base while tightening.
	Dust between base and door edge	Loosen knobs, blow out and re-tighten.
	Dust between template and base	Remove template and blow out the dust.
Mortise not centered on edge of door	Door thickness gage not set correctly	Measure the door thickness carefully, use the correct gage ruler
	Door thickness gage out of adjustment.	Adjust the door thickness gage adjustment screws.
	Router bit not centered in the router guide bushing	Rotate the router base until the bit is centered in the guide bushing as measured across the thickness of the door. Then mark the router base with an arrow pointing to the gage side. Always use the router in this orientation on the <i>RTS-4</i> base.
	Gage knobs loose or tightened after black knobs	Repeat steps 1 and 2 of the Step by step instructions on page 6.
	Tightening knobs (black) too tight	Loosen the black knobs. Over tightening is not necessary and may damage the <i>RTS-4</i> .
Edge and end cuts don't align	Door thickness gage not set correctly	Be sure that the same side of the base stays on the same side of the door when you move the base from edge to end. You must move the end stop to the opposite end of the base.

APPENDIX

**CALIBRATION OF THE DOOR THICKNESS GAGE**

Two adjusting screws are used to calibrate the door thickness gage for dimension and to bring the *RTS-4* base parallel with the door. To adjust the screws, remove the 2 fence screws with springs that hold the wood fence on the gage side, figure A1. Removing the wood fence reveals the locknuts on the 2 adjustment screws. Remove both lock nuts and replace the wood fence and the 2 fence screws with springs.

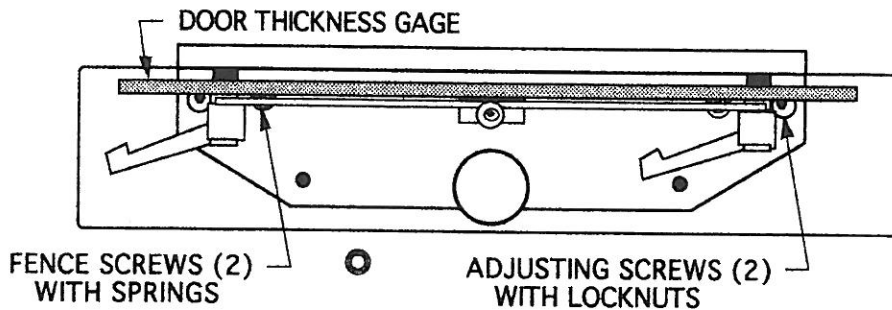


Figure A1. Fence screws and adjusting screws for adjusting the door thickness gage.

Adjust the base unit tilt so that the wood fence is set as for a square edged door, work face square with the top plate. Set the door thickness gage to 1-3/4", figure A2, following the instructions in step 1 of the step by step instructions on page 7. Loosen the green knobs slightly, and turn the adjusting screws as necessary using the 3/16" hex wrench provided. Adjust the screws until the dimension (a) is exactly 1-1/8" (1.125"), or until a 1" wide centered mortise cut into a sample door edge is spaced exactly 3/8" (0.375") from the gage-side of the base unit after the green knobs are retightened. Repeat this procedure until the measurements are exactly correct at both ends of the base unit.

After the 2 adjusting screws are adjusted, remove the wood fence and replace the locknuts. Use the 3/16" hex wrench to keep the screws from turning while tightening the lock nuts. Replace the wood fence. Make sure that the 2 screws holding the fence do not protrude past the working surface of the fence, so that they will not mar the door. Verify the adjustment after the fence is replaced.

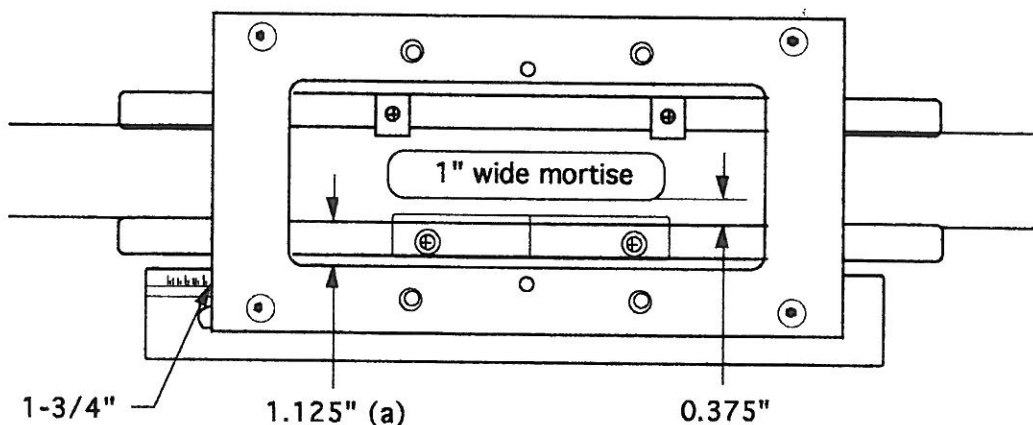
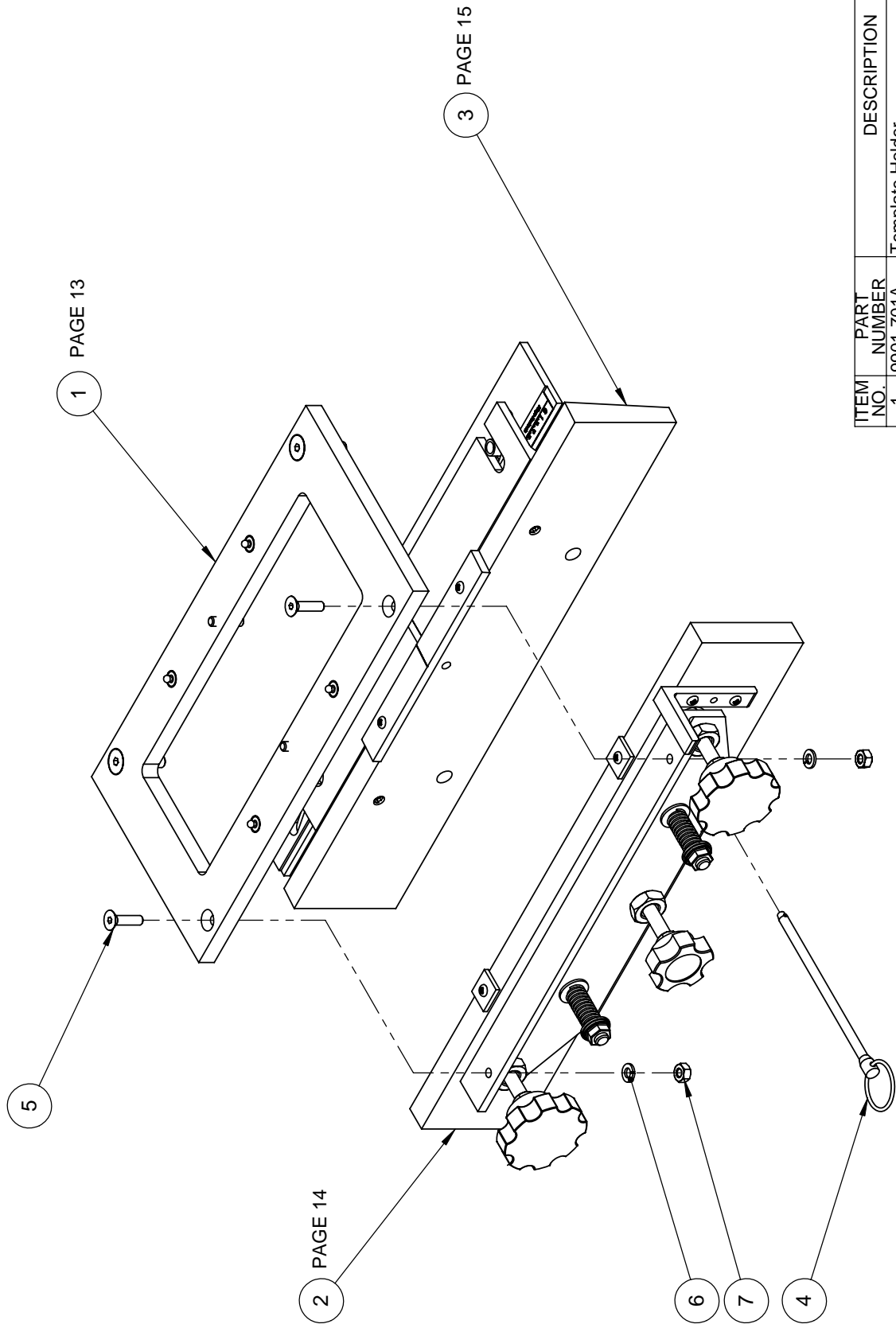
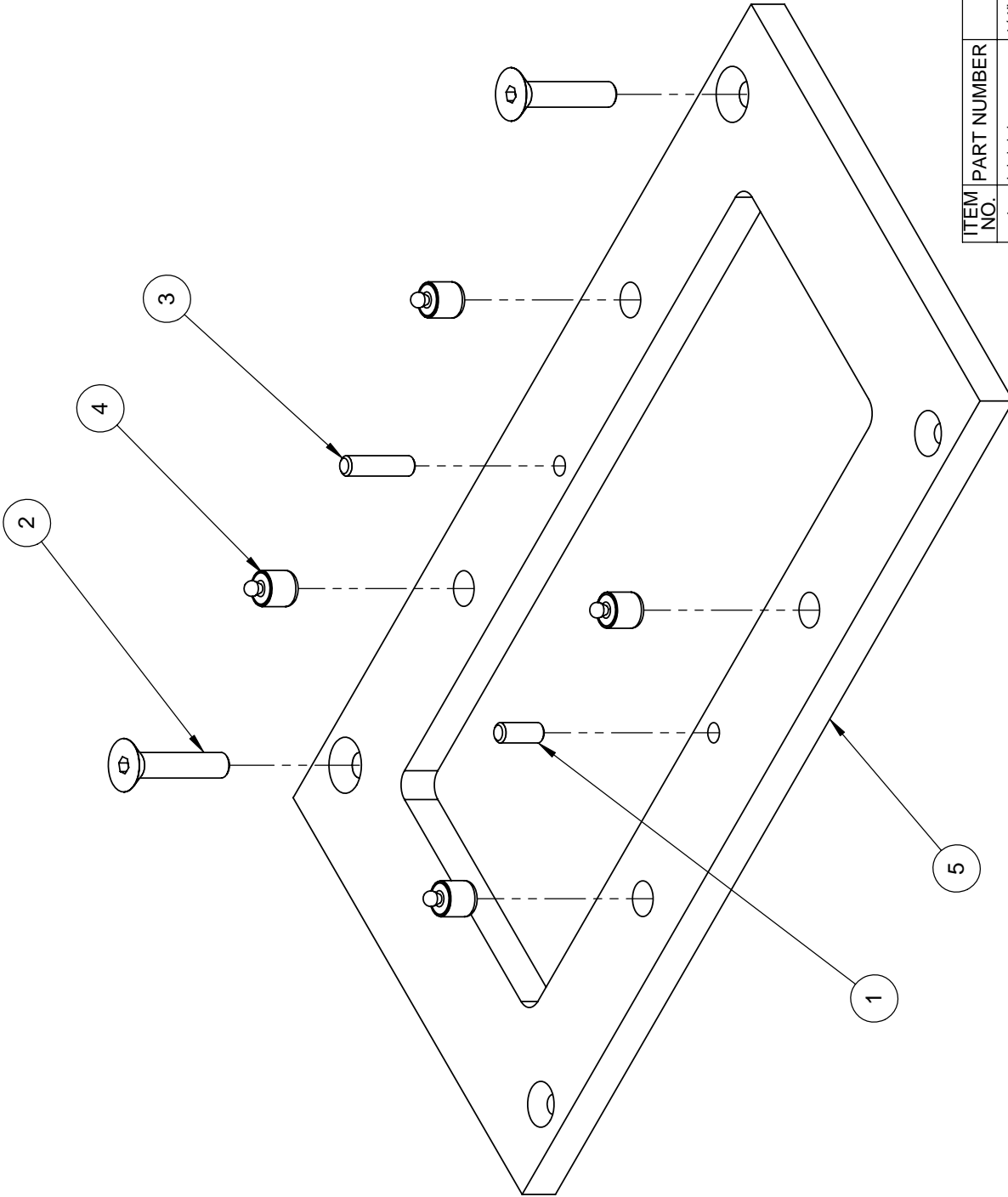


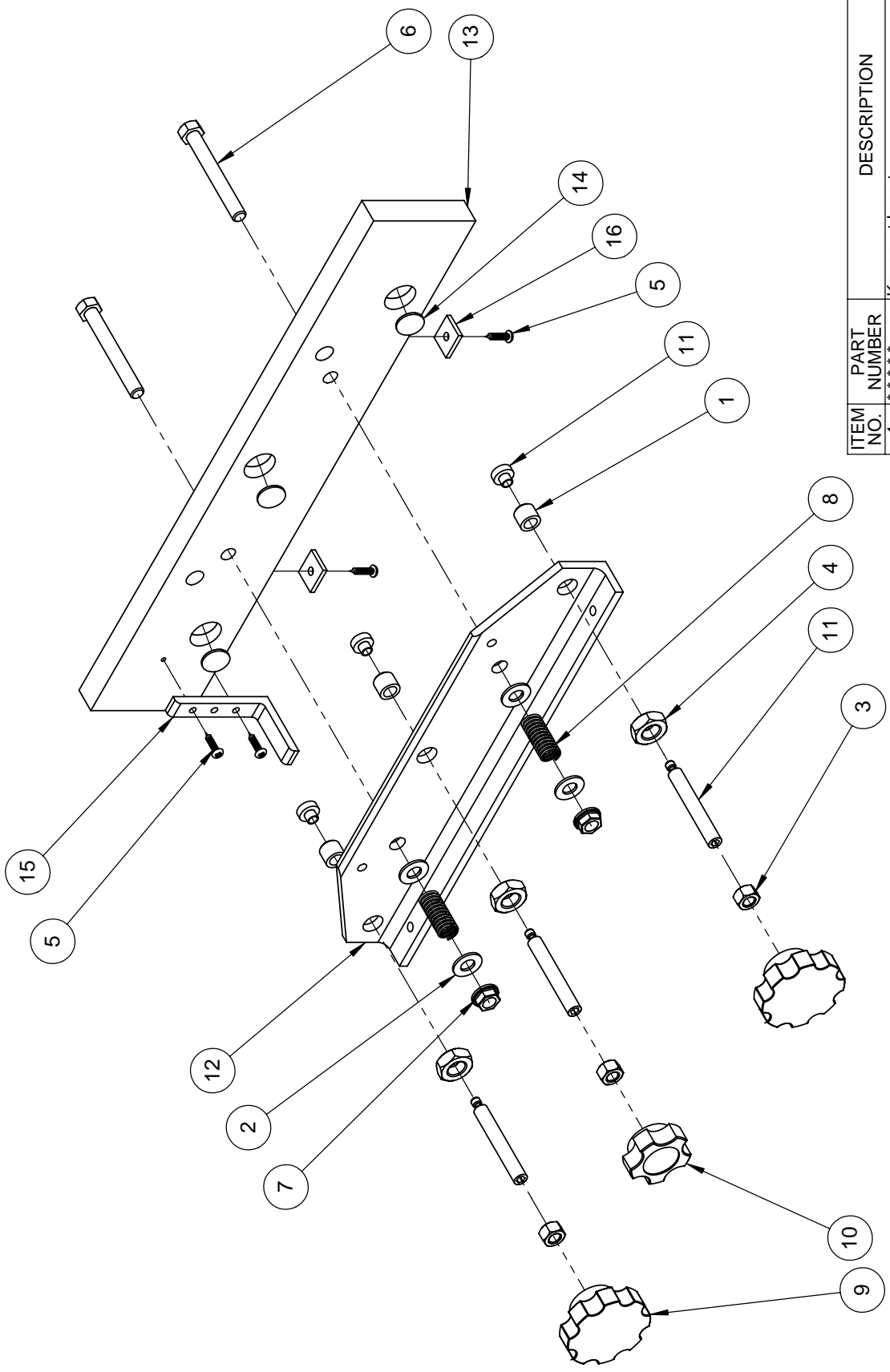
Figure A2. Calibration dimensions for the door thickness gage.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	9901-701A	Template Holder	1
2	9901-701B	Free Side	1
3	9901-701C	Gauge Side	1
4	13-867	DETENT PIN	1
5	*****	1/4-20 x 1" Flat Head Cap Screw	2
6	*****	1/4" Lock Washer	2
7	*****	1/4-20 Hex Nut	2

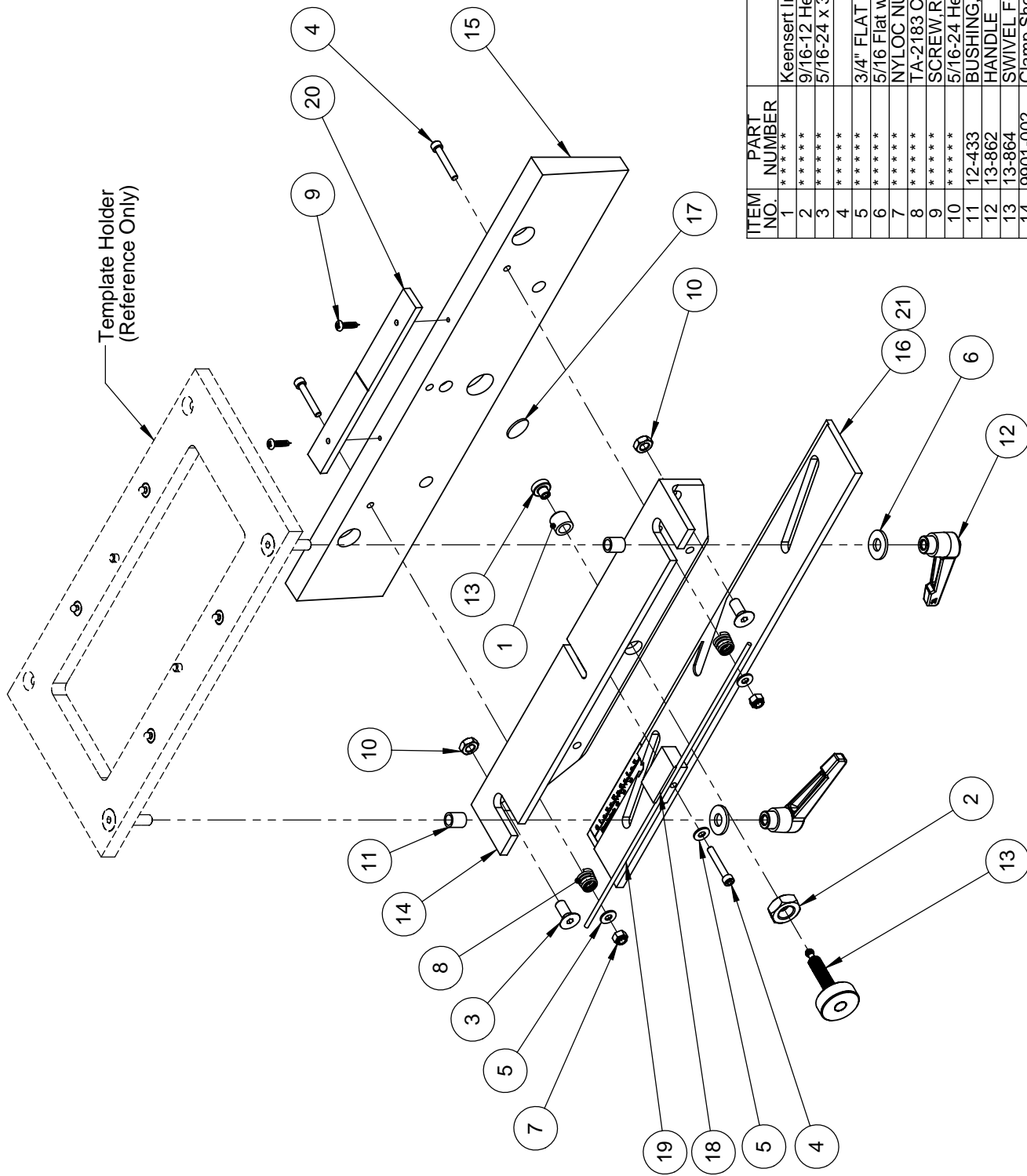


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	*****	1/4" X 5/8" DOWEL PIN	1
2	*****	5/16-18 X 1-1/2 FHCS	2
3	*****	1/4" X 1" DOWEL PIN	1
4	13-579	Car-Lane CL-7-SLP-2 Pin	4
5	9901-001	Template Holder	1



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	*****	Keensert Insert	3
2	*****	3/8" Flat Washer	4
3	*****	3/8-16 Hex Nut	3
4	*****	9/16-12 Hex Jamb Nut	3
5	*****	SCREW ROUND HEAD, PHILLIPS, #8 X 3/4	4
6	*****	Hex Hd Bolt 3/8-16 x 3.00	2
7	*****	3/8-16 SERRATED HEX NUT	2
8	*****	CL-7-SPG COMPRESSION SPRING	2
9	13-860	Innovative KN6C-F6-B-21 Knob	2
10	13-861	Knob, 1-3/4 DIA.	1
11	13-863	CLAMP SCREW	3
12	9901-003	STATIONARY CLAMP SHOE	1
13	9901-004	Clamp Pad	1
14	9901-007	CLAMP PAD SUPPORT	3
15	9901-008	SQUARING GUIDE	1
16	9901-009	Support Tab	2

**9901-701B - Free Side**



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	*****	Keensert Insert	1
2	*****	9/16-12 Hex Jamb Nut	1
3	*****	5/16-24 x 3/4" Flat Head Cap Screw	2
4	*****		3
5	*****	3/4" FLAT WASHER	3
6	*****	5/16 Flat washer	2
7	*****	NYLOC NUT, #10-32	2
8	*****	TA-2183 COMPRESSION SPRING	2
9	*****	SCREW, ROUND HEAD, PHILLIPS, #8 X 3/4	2
10	*****	5/16-24 Hex Jamb Nut	2
11	12-433	BUSHING, 5/16 ID X 7/16 OD	2
12	13-862	HANDLE	2
13	13-864	SWIVEL FOOT, CLAMP SCREW	2
14	9901-002	Clamp Shoe	1
15	9901-005	Stationary Clamp Pad	1
16	9901-006	CLAMP GAUGE	1
17	9901-007	CLAMP PAD SUPPORT	1
18	9901-010	RETAINER SPRING SUPPORT	1
19	9901-011	CLAMP RETAINER SPRING	1
20	9901-012	ALIGNMENT PLATE	1
21	9908-495	LABEL, SCALE	1

**9901-701C - Gauge Side**