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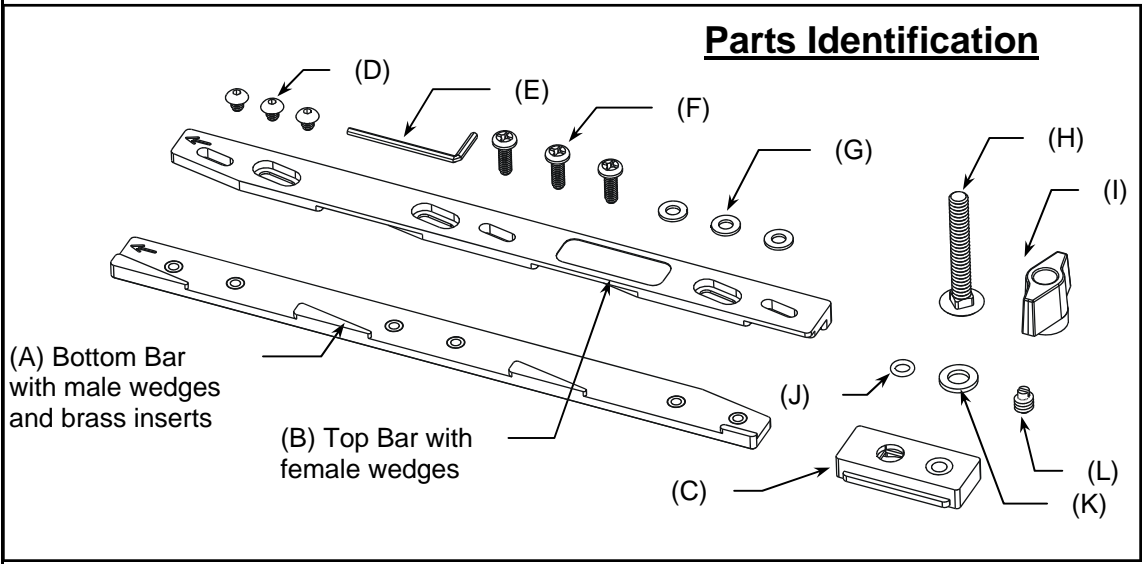
Model #	# Guide Bar sets	# Miter Stops
ZP9- B2S1 for MJ Taper Jig model TJ-502ZP only	2	1
ZP9-B2S2	2	2
ZP9-B1	1	0
ZP9-S1	0	1

MJ ZeroPlay™ Guide Bar System

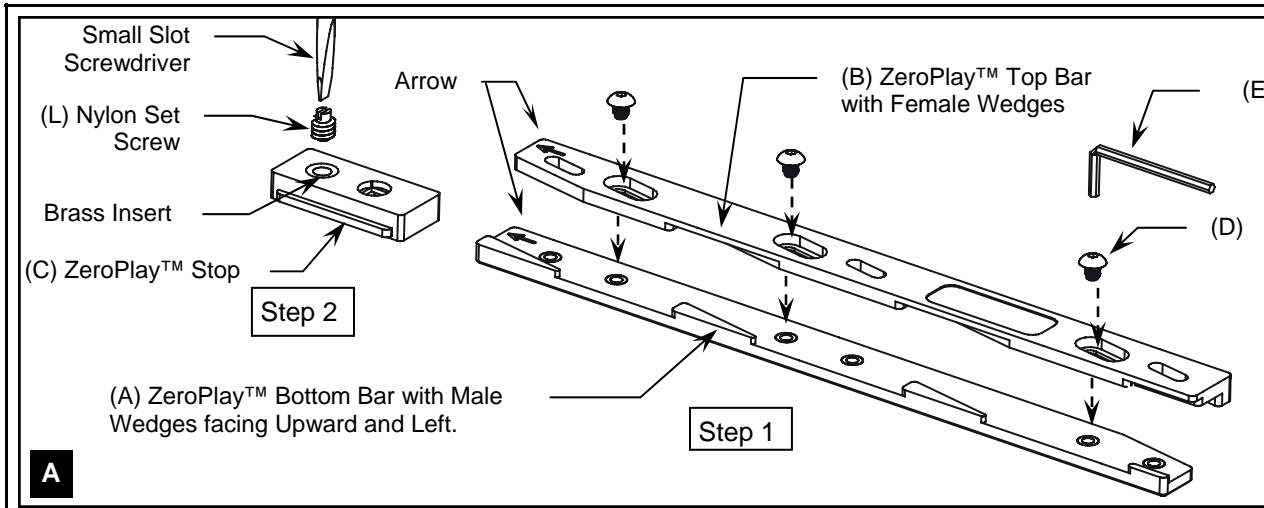
ZP9 Series - User Manual (V1.0) 1005

**A zero tolerance Guide Bar System for shop built jigs and fixtures.
 Custom fits standard 3/4" x 3/8", ShopSmith and General miter slots.**

Slot Width Range: 0.730" - 0.790" (18.54mm—20mm)
 Slot Depth: minimum 5/16" (7.94mm)



Parts for each set of ZeroPlay™ Guide Bars		Qty	Part #
(A)	ZeroPlay™ Bottom Guide Bar	1	ZP-P1
(B)	ZeroPlay™ Top Guide Bar	1	ZP-P2
(D)	#8-32 x 3/16" Button Head Screws	3	ZP-H1
(E)	3/32 Hex Wrench	1	ZP-H2
(F)	8-32 x 1/2" Pan Head Machine Screws	3	ZP-H3
(G)	#10 Flat Washers	3	ZP-H4
Parts for each ZeroPlay™ Stop			
(C)	ZeroPlay™ Stop	1	ZP-P3
(H)	1/4-20 x 1 3/4" Carriage Bolt	1	ZP-H5
(I)	1/4-20 Thumb Knob	1	ZP-H6
(J)	5/16 OD O-Ring	1	ZP-H7
(K)	1/4" x 1/2" Stainless Flat Washer	1	ZP-H8
(L)	Nylon 1/4-20 x 1/4" Set Screw	1	ZP-H9



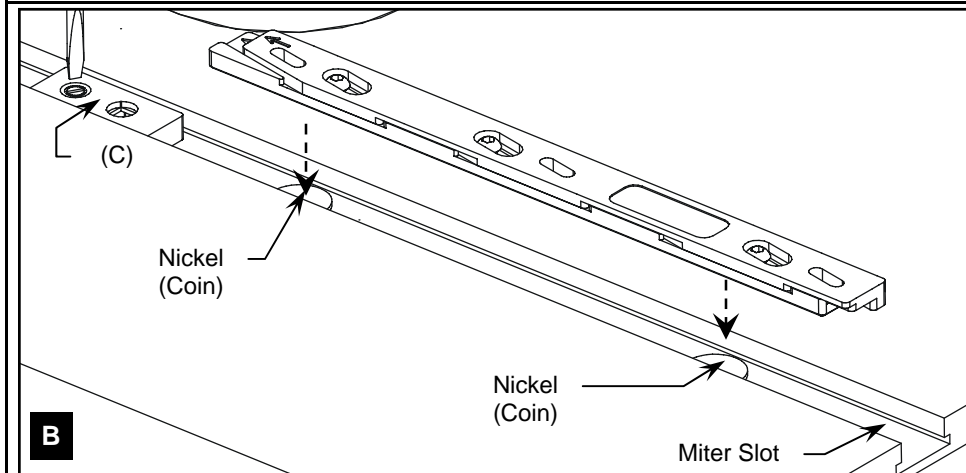
Assembly Steps

Step 1

- Identify ZeroPlay™ (ZP) Bottom Bar (A) with brass inserts.
- Identify ZP Top Bar (B) with oblique screw slots.
- Stack the ZP Top Bar (B) onto the ZP Bottom Bar (A) with arrows facing upward and pointing towards the front.
- Insert the three (3) button head screws (D) through the counter-bored slots of the ZP Top Bar (B) and loosely secure the ZP Top Bar (B) to the ZP Bottom Bar (A) using the supplied hex key (E). Make sure the two bars are still free to slide against each other.

Step 2

- Insert and thread the Nylon Set Screw (L) into the brass insert of the ZeroPlay™ Stop (C) with a small slot screwdriver.



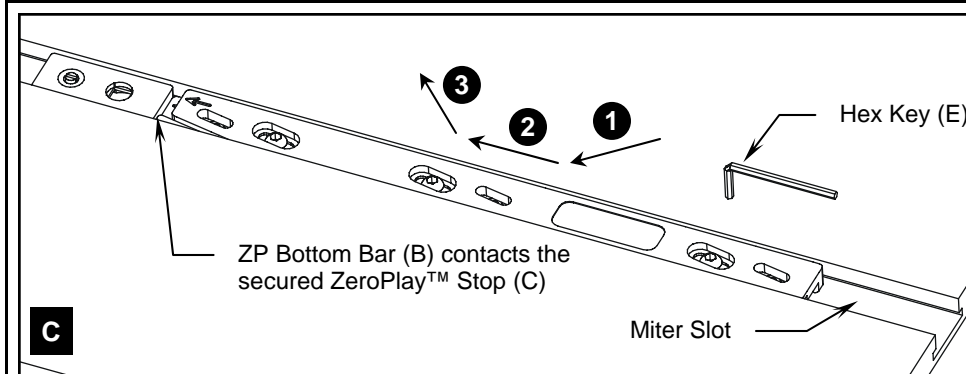
Step 3

- At about 10" to 12" from the edge of the miter slot, secure the ZeroPlay™ Stop (C) from Step 2 in the miter slot by tightening the Nylon Set Screw (L) with a small slot driver.

Step 4

- Place two nickels (5¢ coin) at the bottom of the miter slot at the approximate locations as shown in Drawing "B" (left).
- Place the ZeroPlay™ Guide Bar Assembly from Step 1 onto the two nickels, and against the secured ZeroPlay™ Stop (C).

Note: If you are using an aluminum extruded miter track on a router table, make sure the aluminum track is installed straight and level - all mounting screws must be tightened evenly. It is best that the aluminum track is secured with machine screws bolted through the bottom of the table top - this is especially important if you will be using a hold-down clamp with the ZeroPlay™ Stop (see page 2 of this manual) in the aluminum miter track.

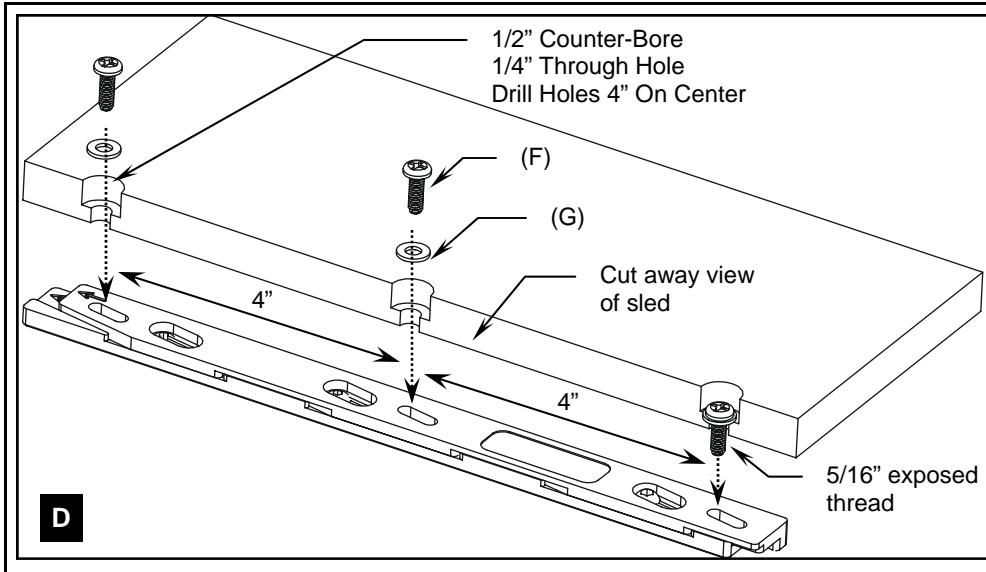


Step 5

- Using very light finger pressure, push the ZP Top Bar (B) in the direction of the arrows shown in Drawing "C" (left).
- First push the ZP Top Bar lightly to the left as shown by arrow ① - this will bring the ZP Bottom Bar in contact with the left wall of the miter slot.
- Using very light finger pressure, push the ZP Top Bar (B) forward as shown by arrow ②. Because of the opposing wedges, the Top Bar (B) will expand parallel in the direction indicated by arrow ③ and come in contact with the right wall of the miter slot.

This is very **IMPORTANT**: **STOP** pushing the ZP Top Bar as soon as it just starts "kissing" the right wall of the miter slot. While the ZP Guide Bar Assembly is secured on the jig or fixture, it tends to expand about 0.002" when the mounting screws to the sled are tightened. A very tight fit is NOT recommended during the above calibration steps as it may cause binding afterwards.

- After adjusting to the correct width, securely fasten the three button head screws (D) with the supplied hex key (E) while applying light finger pressure through the ZP Top Bar (B) to fix all components securely in position.



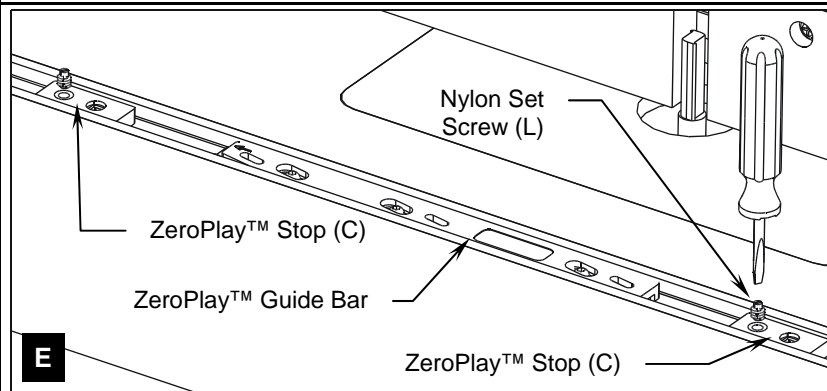
Depending on the size of your jig or fixture, a minimum of two mounting screws are required to mount the ZeroPlay™ Guide Bar Assembly through the top of the jig or fixture.

Step 6

- Drill three oversized counter-bored holes on the top of your jig that are 4" on center at the desired locations. Use a 1/4" drill bit for the through holes and a 1/2" flat bottom drill bit for the counter-bores. The supplied mounting screws are #8-32 x 1/2" (F) - 5/16" of screw thread must be protruding from the bottom of your jig for mounting the ZeroPlay™ Guide Bar Assembly. If you are using a 1/2" thick sled, the counter-bore should be 5/16" deep; use a 9/16" deep counter-bore for a 3/4" thick sled. Alternatively, you may switch to longer #8-32 pan head machine screws, but **DO NOT** use flat head screws. If you counter-bored too deep, you may add additional thin washer(s) to correct the problem. Note: We supply #10 washers (G) for this application because it will provide more support for adjustment in oversized counter-bored holes.
- Use a drafting square or a machinist's square to calibrate your jig to the fence or saw blade while tightening the mounting screws (F). Calibrating a jig from the top eliminates trial and error in setup accuracy.

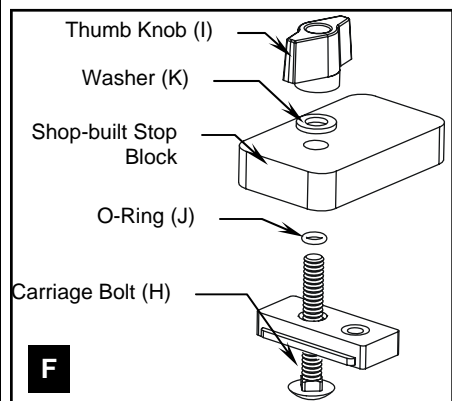
You may use two ZeroPlay™ Guide Bar Assemblies in tandem or in multiple sets for larger jigs or fixtures. Retro-fit your loosely-fitting runners with the ZeroPlay™ Guide Bar System!

This section illustrates how to use the ZeroPlay™ (ZP) Stop in a standard 3/4" x 3/8", Shopsmith or General 350 miter slots.

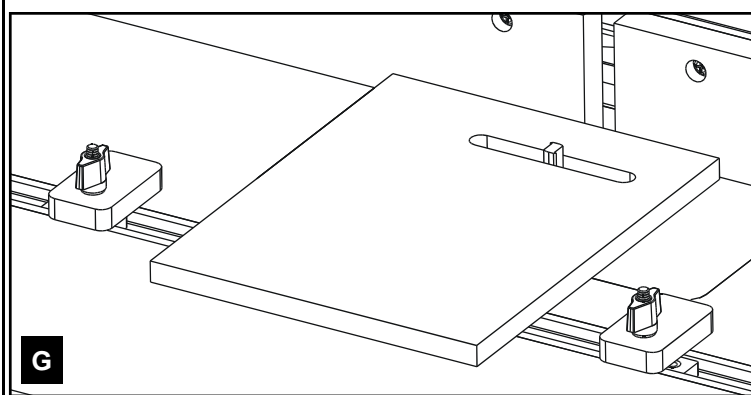


The ZeroPlay™ Stop (C) can be secured in the miter slot by fastening the Nylon Set Screw (L) with a small slot screwdriver. The distance of cutting length is determined by how far the ZP stops are secured away from the ZeroPlay™ Guide Bar. Use two ZP Stops for stop-dado or slot cutting on router table.

For the purpose of clarity, a sled to which the ZeroPlay™ Guide Bar is secured is not shown. The contacts to the ZeroPlay™ Stops (C) in this setup are to the ZeroPlay™ Guide Bar and not to the sled.

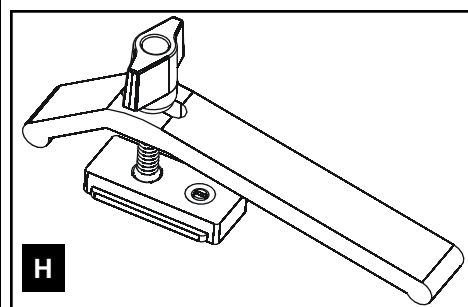


The ZP Stop can also be used as a stop with a shop-built stop block as shown in Drawing "G" (right). To assemble, insert hardware and the shop-built stop block in the order shown in Drawing "F" (left). The O-Ring (J) must be pushed all the way onto the Carriage Bolt (H) and into the recess on the ZP Stop before inserting the rest of the components.

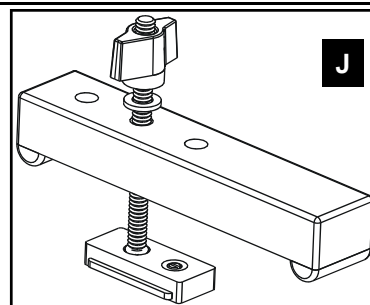


The ZP Stop (C) with a shop-built stop block as shown in Drawing "F" can be used as stops for stop-dado or slot cutting on a router table. This setup does not require that ZeroPlay™ Guide Bars be installed. Direct contact is made between the work piece and the ZP Stop Blocks.

Please observe the note from Step 4 on page 1.

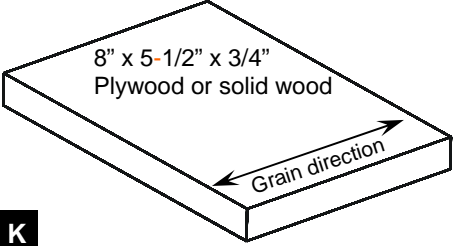
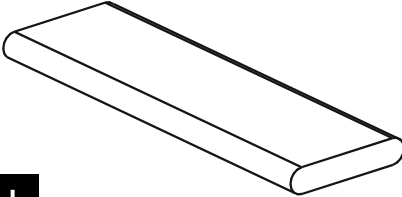
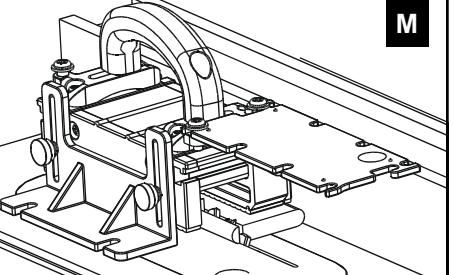
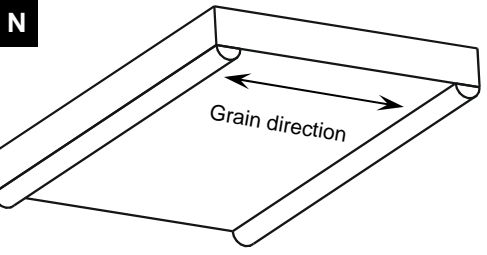
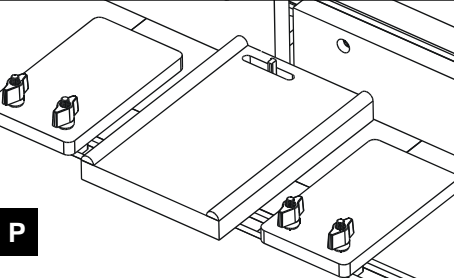
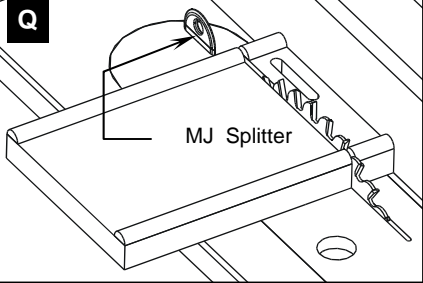
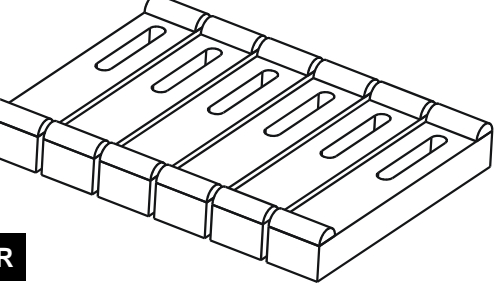
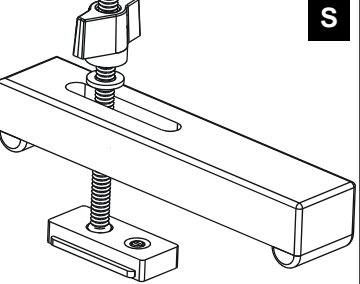


The ZP Stop can also be used as an anchor for a hold-down clamp in a miter slot. Hold-down clamps are widely available from many mail order companies. The ZP Stop will only accept a 1/4-20 T-Bolt or Carriage Bolt. If the supplied carriage bolt is too short for your application, different lengths of 1/4-20 carriage bolts are available from most home centers.

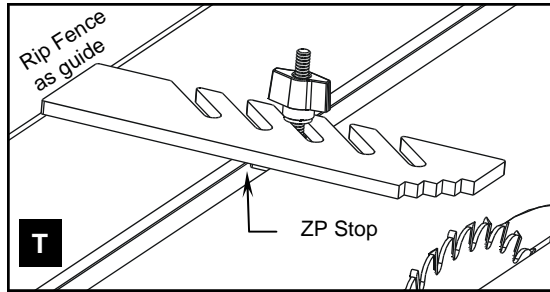


If you do not have a commercial hold-down clamp, one can be easily made from scrap material as shown in the following drawings.

You can drill multiple 5/16" through holes as shown in Drawing "J" to accommodate various clamping lengths, or cut a slot as shown in Drawing "S". It is recommended that a supporting block that equals the thickness of the work piece is placed under the opposite end of this shop-made clamp prior to the application of any clamping pressure.

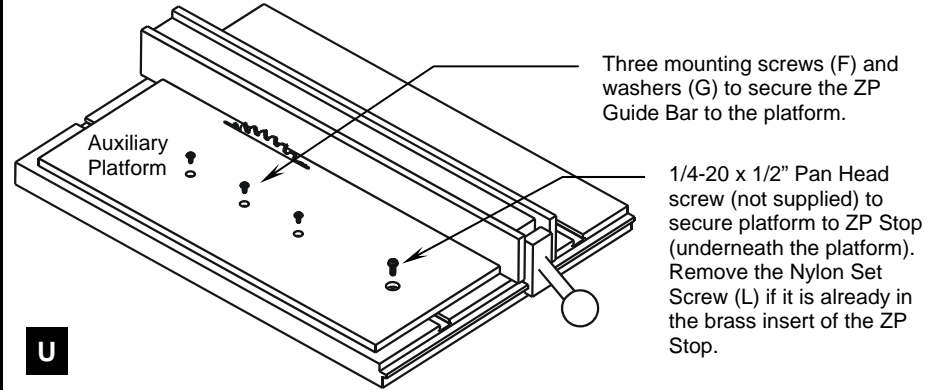
 <p>8" x 5-1/2" x 3/4" Plywood or solid wood</p> <p>Grain direction</p> <p>K</p>	<p>Step 1 - Prepare the Clamp Body Base</p> <ul style="list-style-type: none"> To build a shop-made hold-down clamp, first prepare a piece of plywood or solid wood that is 8" x 5-1/2" x 3/4" thick. Stock that is 1/2" thick can be used for light duty applications. <p>If you are using solid stock, pay attention to the grain direction as shown in Drawing "K".</p>	 <p>L</p>	<p>Step 2 - Prepare the Clamp Foot</p> <ul style="list-style-type: none"> Prepare a 1/2" thick x 2.5" width x 8" length of solid wood stock. Use a router bit to create a 1/2" round-over profile along both long edges as shown in Drawing "L" (left). <p>If you do not own a 1/2" bull-nose router bit, a 1/4" radius corner round bit can be used with the proper router fence setup.</p>
 <p>M</p>	<p>Step 3 - Trimming the Clamp Foot</p> <p>The fence settings shown here are for stock from Step 2 that is precisely cut to 2-1/2" in width.</p> <ul style="list-style-type: none"> First set the fence at 2-1/8", and rip with the round-over profile to the left of the blade. Second, rip with the fence set at 1-3/4" - flip the stock over. This operation is best performed with the GRR-Ripper® and Trailing Hook (not shown). 	 <p>Grain direction</p> <p>N</p>	<p>Step 4 - Glue the Clamp Foot</p> <ul style="list-style-type: none"> Glue and clamp the two half-round pieces (Clamp Foot) from Step 3. Wait until the glue is completely cured before proceeding to the next step.
 <p>P</p>	<p>Step 5 - Rout an Offset Slot - Recommended Method (Alternatively - Drill Holes as in Drawing "J")</p> <ul style="list-style-type: none"> Using a 5/16" straight router bit, set the fence at 9/16" from the center of the router bit. It is best to use double ZP Stops for large and long stop blocks. If you don't have enough ZP Stops, C-clamp a stop block on the router table. Rout a 2" long offset slot from the center to one side of the clamp foot. Using a GRR-Ripper® (not shown) with a drop-in technique is the safest and most accurate method. 	 <p>MJ Splitter</p> <p>Q</p>	<p>Step 6 - Rip to Width</p> <ul style="list-style-type: none"> Rip the slotted clamp to a width of 1-1/8" with the top facing down. Repeat Step 5 and Step 6 for the next clamp. Using a GRR-Ripper® (not shown) is strongly recommended.
 <p>R</p>	<p>Step 7 - Total of Six (6) Clamps</p> <p>Continue to repeat Step 5 and Step 6 and you will have six (6) clamps in total.</p>	 <p>S</p>	<p>Step 8 - Assemble the Clamp</p> <p>Assemble the clamp in the same manner as shown in Drawing F. Slide the carriage bolt within the slot to best fit your application. If you built a drilled-hole version as shown in Drawing J, you will need to unthread the knob and move the carriage bolt to a different hole to suit your needs.</p> <p>The supplied carriage bolt (H) is 1/4-20 x 1-3/4" in length, which might not be long enough for this clamp. You may acquire a longer length in most home centers - make sure it has 1/4-20 threading.</p>

Additional Clamping Functions of the ZeroPlay™ Stop



Other Clamping Functions

There are times when a fixture has variable clamping positions—such is the case with the Cross Cutting Step Gauge Block shown in Drawing “T”. The multiple open slots on the Gauge Block allows for various adjustments in distance of the step gauge from the saw blade when used as a cross cutting length gauge.



When cutting thin material such as veneer or plastic laminate, it is best to add an Auxiliary Platform to prevent material from slipping under the fence. See Drawing “U” above. The Auxiliary Platform also serves as a ZCI.