

I recently attended a three day training class and had the pleasure of working on a Robust American Beauty lathe. The one feature that I was most impressed with was the Tail Stock Tilt Away Device. The tail stock slides out off the end of the ways onto the device, is locked in place with the normal lever, and then the entire tilt away device rotates 90° toward the "back" of the lathe. (See picture) Apparently, it can also rotate in the opposite direction for certain types of turning.



I own the Powermatic 3520 B. When not needed, its tail stock slides off the end of the ways and has to be "stowed" somewhere. I had previously made a simple rest with a big slot down the middle to allow the locking mechanism to sit below the two side surfaces of the table. The rest sat on a movable worktable near the latest. That situation presented two problems. The first was that the table on which the rest sat was often moved out of position requiring me to juggle items to bring the table and rest as close as possible to the end of the ways to minimize the distance I had to carry the tail stock. The second problem was that I had previously purchased a "T-Rex" brand tool rest. (See picture) The T Rex is placed on to the ways and can be tightened anywhere along the ways. If it is placed between the tail stock and headstock, it gets in the way of the banjo and the tail stock for anything other than spindle turning. If it is placed to the right of the tail stock, it has to be removed with all the tools that are generally on it and set down somewhere while the tail stock is then slid off the ways when required. I solved the problem with two of what Phil likes to refer to as "pimping out the machine"

In addition, since my workshop set up did not have a wall conveniently either in front or in back of me, I did not have a convenient "rack" on which to put my gouges. That became the third "pimp out".

The solution to the tail stock removal and storage went through two versions. I will show the first version here but you should know that I rejected it after use for short period of time for safety concerns.

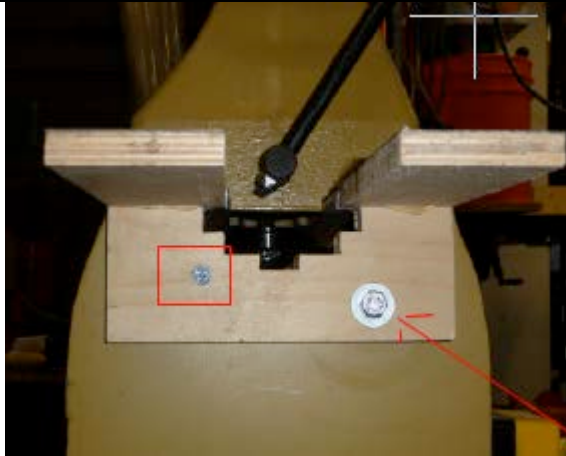


The first photo is what the two additions to the right side of the lathe look like as built. I used three-quarter inch plywood except for the two side pieces on the top piece (which may appear gray in the photo) which are half-inch plywood with laminate glued and waxed on top for smooth sliding of the tail stock. All pieces in both units are glued and screwed. The top unit uses two 2" screws on each horizontal piece (covered by the laminate).

Half-inch material had to be used for those top surfaces because there is limited room between the top of the tail stock's clamping "disk" and the bottom of the tail stock itself.



This photo shows the tail stock having been slid out onto the tilting device.



This photo was taken looking directly at the tilt device from underneath. The hex bolt to which the red arrow points is threaded into one of the holes that are standard on the 3520 two which you can attach extension ways. The red rectangle to the left showing the location of a flat head machine bolt which extends through that piece of wood and acts as a limit stop and which, along with the hex bolt, supports the piece when the tail stock is attached. The staircase-like cutout allows the locking unit to pass through the vertical piece of plywood and then be tightened up against the underside of the two horizontal pieces. (Actually, the middle step was not necessary since the piece of the locking mechanism that wide is actually above the locking wider disk. Oops)

The location of the holes through the plywood for both the pivoting hex bolt and the stopper bolt is whatever locations will cause the top surfaces to be level with both ways.



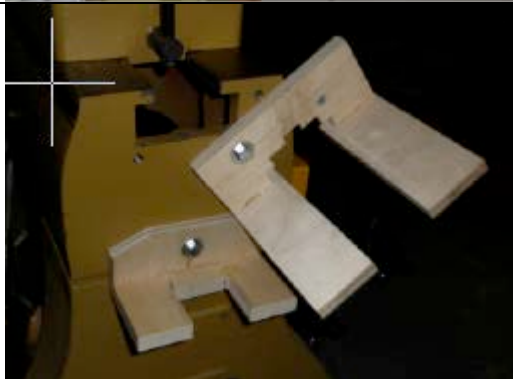
This photo was taken looking down through the ways to the back of the plywood showing the Flathead bolt resting in place. The side to side location of the hole for that bolt required a little experimentation since it has to clear the way that is above it when the unit is rotated clockwise (counter-clockwise in this photograph) and it has to clear the outer edge of the back way as it passes the back of the machine. (See next



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This photo shows the unit pivoted 180° with the tail stock hanging down. In this photo, the lower unit for the T Rex is not in place.



This shows the top unit without tail stock rotated clockwise. Since the top and bottom units are in the same vertical plane against the end of the lathe, I trimmed the upper right-hand corner of the lower unit to a point where it stopped the upper unit's rotation when the upper unit was out of the horizontal plane of the ways.

After using this setup for a very short period of time, I got concerned that the entire weight of the tail stock was being supported by the one bolt. Being a bit of a "belt and suspenders" guy, I decided to change the design. I went online to see if there were any articles where someone else had done this already and found two websites: [Swingcoeur-de-larbre.com](http://swingcoeur-de-larbre.com) has an article entitled "Swing-Away Tail-Stock for the Powermatic 3520". A second site is <http://petergerstelwoodworking.com>. The first was made of all wood and the second was made of all aluminum. Not having worked with aluminum before, but liking some of the design features, I decided to design and make a hybrid. I use the general design of the first website but used aluminum from the second website for the way surfaces and added the way leveling system described below.



This shows the swing away in a partially open position. I used 1/4 inch aluminum plate for the attachment to the lathe and for the top of the movable ways. Escondido Metal Supply, just west of Harbor Freight on Mission Avenue in Escondido, has lots of scraps of aluminum which is easily cut with a jigsaw.

I chose the hinges (Home Depot) shown for the added length to attach onto the wood to distribute the stress. No wood screws were used except for one location noted below. I used 1/4" hex bolts, washers, lock washers (where appropriate) and nuts throughout.

I made the aluminum mounting plate 12 inches wide, but it could be made more or less. This length determines how far away the platform and tailstock will be from the ways when swung open. The metal ways were drilled and countersunk to allow the bolts to sit below the surface of the aluminum.

The aluminum ways were Gorilla glued to three-quarter inch ply. A dado was cut along the length of the inside bottom edge of each of the way assemblies so that the total thickness of the aluminum plus remaining wood would equal the thickness of the ways on the lathe itself so that the tail stock locking mechanism could slide on and lock in place.



Three bolts were used to support each way. Each bolt had a washer and a nut directly under the way assembly and another nut and washer resting on the three-quarter inch plywood platform. By turning the lower of the two between the two layers of plywood, the height of the way assemblies could be adjusted. The bolts were arranged in a triangle with two in the same line in the front and back. The third was offset to form a triangle with the first two and located midway between the two end bolts.. This allowed adjustment of the ways to tilt front and back and side to side by the tightening and loosening of the nuts and washers. Each bolt had another washer, lock washer and nut on the lower surface of the support platform.



This shows the platform in its closed and locked position. You need some sort of lock so that the unit does not swing away as you are pulling the tailstock onto it. Home Depot has a package of two "drawer catches" which are shown in this photo. The quarter inch thick aluminum was thick enough to accept the screws to mount one side of the catches so that I did not have to drill holes in the lathe with the other side screwed into plywood.

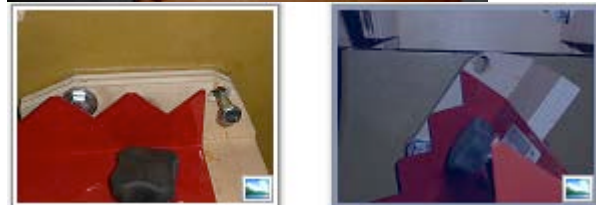
In the previous photo, you can see two gussets (the vertical support members). Dadoes were cut into the plywood "door" (the vertical hinged piece) and into the horizontal platform that the ways are attached to. Be very careful about the placement of those gussets. You don't want them interfering with your ability to put a box wrench or socket onto the bottom nut that are on the six leveling bolts. I used 1/2 inch ply for the gussets to keep the blockage to a minimum. Remember, with the dadoes cut in the plywood, there is very limited three-quarter inch thick wood left on the underside of the way supports. Even if you drill the holes for the bolts through the aluminum so as to be as close to the edges of the full thickness of the plywood, you will not have very much clearance if you misplace the gussets or use three-quarter inch ply.



Depending upon the hinges that you use, the mounting holes may well end up with close to the gussets making it difficult or impossible to put on the washers and nut. I saw that this was going to happen and cut notches in the gussets to allow me access to the ends of the two bolts that came through the "door" by the gusset.



The swing away tail stock extension mounting holes. I was still able to use the lower mounting location to attach my T Rex. I have the T Rex bolted into only one of the holes. This allows me to pivot it down and out of the way when not in use. When in use, a smaller diameter bolt slides through the plywood and into the second mounting hole to keep the unit from pivoting.



Total cost was less than \$25 for the aluminum and hardware. I took one of the lathe brackets to Home Depot and had them match up the color for small can of "mustard monster" paint.

Happy turning.

Eric