

Fret Saw Crank and Eccentric build.

Crank Build:

I started out with a 1.5 X 2 X 1 inch block of T6 6061 Aluminum. I borrowed a Fret Saw crank from J. Edwards, a member of this group, to allow me to obtain measurements and pictures. I used those measurements to create a dxf file in the files section that can be uploaded to an abrasive water jet to cut a blank for machining. The dimensions used were metric.

I did mine the old fashioned way, I laid out the shape on the aluminum block, cut away the diagonals such that I had a rough teardrop shape to machine.

I then laid out the centers for the drive bearing and the pitman pin at 26 mm center to center.

I drilled and tapped the drive cam's bearing center 12-1 to thread on the spindle. Using a horizontal mill attachment from a Taig lathe and mounting the tool holder sideways, and using a miniature parting tool from Micro Mark, 1/16" wide cut and a few thousands at a pass. I cut the gap 13 mm wide and to a center diameter of 34 mm, the lobes were left at 5 mm thick, however the stock crank lobes are 4 mm thick. I added the extra material as I have seen pictures of the lobes cracked on some fret saws. I had to reverse the material on the spindle to allow cutting the proper depth of the gap. I was only able to get approximately 13 mm total reach without running into the vertical slide that left only about 8 mm wide gap, so I flipped it over and cut from the other face.

I couldn't figure out a way to easily mill away the excess material on the sides of the lobes other than filing to remove the material from the area and contour the curves. I then came up with mounting my belt sander inverted on my bench vise and using an 80 grit belt, sanded the sides and contoured the curves leaving about 12 mm above the center for the drive pin, and matched the 34mm diameter between the lobes.

I mounted the shaped cam back on the spindle and faced both sides to remove the excess material to the finished 22 mm thickness 2 mm oversized. I then bored the 26 mm opening for the bearing 11 mm deep, I actually cut to about 25.8 mm and using the edge of a 3/8 cobalt tool hand scraped to a press fit for the bearing 26 x 8 mm (6000Z) bearing.

I ordered the bearing from VXB, they were \$2.77 each and \$3 flat shipping so I ordered 3. I did manage to mess one up and I owed Jeff one for denting his.

I had a narrow keyway mill that I mounted as a boring bar and using a couple of teeth engaged milled the 1 mm gap for the snap ring inside edge at 2.8 mm from the outside edge, that allowed for a 0.2 mm clearance for the bearing race to the snap ring.

I mounted the 26 mm open side on the 3 jaw chuck with reversed jaws and gripping the inside. Then using a boring bar opened up the other side to 21 mm for the back side boss.

Using a miniature circular saw mounted in the drill chuck I cut the sides back and cut off the excess to allow the lobe to extend, filing and sanding and deburring finished the lobes. I drilled the 6 mm holes for the roll pin on my Delta drill press. I could have used the Unimat but the drill press didn't need any setup. I actually used a number drill closest to 6 mm since I don't own metric drills, but it worked.

I installed the bearing and C clip in the cam and installed the completed cam onto the saw with the thicker lobes, I used the stock roll pin.

Next project the eccentric.

Build was fairly easy. I started with a chunk of 1x2" chrome steel that I got from a scrapped 12 in gate valve stem. I cut it with a hacksaw more or less square and mounted it in the 3 jaw chuck using a steady rest to hold it square since the grip was only 12 mm on a 2" chunk of steel spinning at 900 rpm. I faced one end then reversed it in the chuck and faced the second end.

Mounted the drill chuck on the tail stock with a 1/4" drill and bored the end approximately 3/4" deep, using a boring bar opened it to 10.8 mm. I tapped it for 12-1, and cut a 3 thread relief boss using the boring bar. I removed the 3 jaw chuck and steady and mounted the blank on the spindle, trued the outside and face, then scribed a ring 6 mm from the center or outside edge, take your pick. I picked a spot and using a center punch marked it, this will be the center of the drive pin.

I installed blank in the 4 jaw and using the marked spot on the end and a drill bit in the tail stock I created a slight indentation for the live center. Using the 4 jaw and the reference point with the live center I squared the bar for cutting the eccentric, turning between the 4 jaw chuck and live center.

Using a left hand bit I cut the pin starting at about 25 mm from the end in the 4 jaw to the end. The diameter of the finished pin is 10 mm and about 10 mm long to engage the cam.

I made my stroke 12 mm and it should have been closer to 10 mm as I had to cut the upper edge of the cam lobe down approximately 1-2mm to keep it from knocking.

I also found my dimensions were a wee off on the length of the eccentric. From the back to the end is 20 mm any longer and the clamp for the saw will not fully engage the quill.

Any questions or corrections please let me know.