Home Metal Shop Club

June 2010

Newsletter

Volume 15 - Number 6

http://www.homemetalshopclub.org/

Since its founding by John Korman in 1996, The Home Metal Shop Club has brought together metal workers from all over the Southeast Texas area.

Our members' interests include Model Engineering, Casting, Blacksmithing, Gunsmithing, Sheet Metal Fabrication, Robotics, CNC, Welding, Metal Art, and others. Members always like to talk about their craft and shops. Shops range from full machine shops to those limited to a bench vise and hacksaw.

If you like to make things, run metal working machines, or just talk about tools, this is your place. Meetings generally consist of a presentation with Q&A, followed by ***show and tell*** where the members can share their work and experiences.

President *Vance Burns*	Vice President *John Hoff*	Secretary *Martin Kennedy*	Treasurer *Emmett Carstens*	Librarian *Dan Harper*
Webmaster/Editor *Dick Kostelnicek*	Photographer *Jan Rowland*	CNC SIG *Dennis Cranston*	Casting SIG *Tom Moore*	Novice SIG *Rich Pichler*

About the Upcoming July 10 Meeting

The July general meeting will be held on the second Saturday of the month at 1:00 p.m. in the Parker Williams County Library, 10851 Scarsdale Boulevard, Houston, TX 77089. Visit the web link http://www.homemetalshopclub.org/events.html for up-to-the-minute details.

Bruce Lunde will give a presentation, "From Drafting to G-Code," on the various aspects of the Computer Aided Design - Computer Aided Manufacturing (CAD-CAM) process.

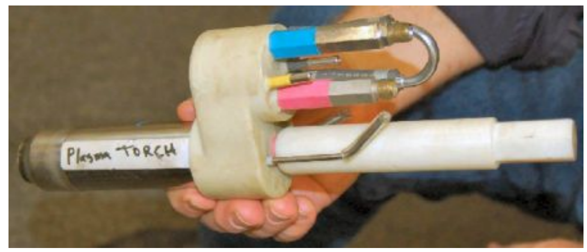
Recap of the June 12 Regular Meeting

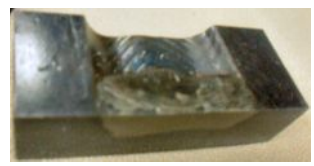
Thirty-one members and five visitors, *Greg Otten, Roger Banda, Ed Ellingsworth, Scott Toney, and John Niediewski* attended the 1:00 p.m. meeting at the Parker Williams County Library. President Vance Burns presided.

Election of club officers and SIG coordinators for the next fiscal year was held. Election results are indicated at the beginning of this newsletter.

Kelly Sumrall has video recorded the last two meetings. We are planning to post edited videos of club meetings on the club's web site so that all the *shut-in machinists* can virtually attend the monthly get-togethers.

First Presentation





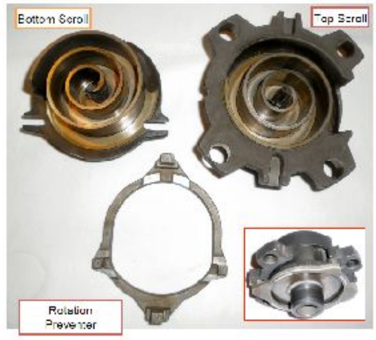
Dan Allford, president of Arc Specialties http://www.arcspecialties.com/ , talked about "Robotic Solutions to Oil Field Problems." He covered welding, cutting, and coating techniques applied by robots to oil field tools. His favorite welding method is submerged arc, but he also touched on the more exotic methods such as Plasma. Laser, and the Atomic Hydrogen torch (see above photos). Many procedures used for gouging, cutting, and hard surfacing are preformed with robots because of their agility, tirelessness, and ability to work in inclement environments. Robots can also locate, identify, and position parts prior to welding, cutting or coating. Exotic metals can be applied as spray powders and fused to the surface of oil field tools without destroying their underlying heat-treated properties by using torches manipulated by robots.

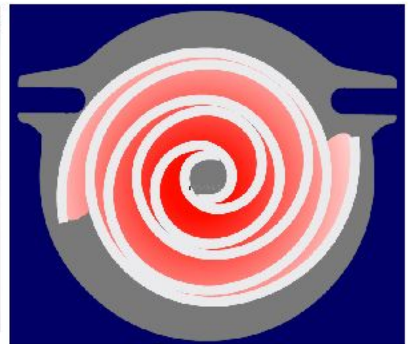
Dan is working on techniques that will manipulate parts using "haptic" or force feedback from a robotic arm. Currently, feedback is obtained by electrical touch or optically with CCD cameras complimented by pattern recognition software.

Slides from Dan's presentation can be viewed at:
http://www.homemetalshopclub.org/news/10/robotic_solutions_to_oil_field_problems.pdf

Second Presentation







Dick Kostelnicek discussed the construction and operation of the scroll gas compressor. They are popular choices for split system residential air conditioners, where the condensing unit is placed outdoors while the evaporator and ventilation unit is inside the residence. Dick cut open a compressor, prior to the meeting, and passed around its upper and lower scrolls (third photo from left) so that all could observe the close tolerances attained during the manufacture of these compressors.

Slides from this presentation and a link to a web video showing the scroll's orbiting motion is available at:
http://www.homemetalshopclub.org/news/10/scroll_compressor.pdf

Show & Tell

Joe Williams demonstrated his *walking / pickup* cane that is tipped (left photo) with an array of ceramic magnets.

Bill Swann made a worm-wheel (right photo) by hobbing a large aluminum disk with a tap mounted in the spindle of a lathe. The wheel was mounted on a pivot attached to the lathe's cross slide. The worm gear, shown in the photo, was turned separately.

Jose Rodriguez machined the six sides of a solid aluminum block in concentric circles. The result is what can only be described a beautiful Christmas tree ornament (right photo).

Joe Scott described his experience with de-rusting gears using a washing soda solution and a DC electric source. He also tested a variety of household chemicals in a quest the find a readily available rust preventative. He determined that Vaseline was best with lard coming in as a close second.

Ed Gladkowski showed a method for driving and extending the reach of a drill bit. The driving extension (upper photo) provides a positive drive for the drill bit. It is machined by drilling a blind hole equal to the diameter of the drill in the end of the extension's shank. A cross-milled slot in the shank mates with a flat milled surface on the driven end of the drillbit. This technique can also be used to drive a tap having a square shank.

Dick Kostelnicek showed his 14-mm tap extension used to ream and collect the carbon buildup in a deeply recessed spark plug hole. The plugs were recessed six inches into an engine block and accessible through 0.90-inch diameter tubes. A large O-ring serves as a depth gauge commensurate with the plug's thread length, while the two small O-rings prevent the cross handle from falling through the reamer's shank. Wheel bearing grease, liberally applied in the tap's flutes, collects the carbon cut from the threads in a plug's hole.

Buster Wilson showed some lightweight titanium tent stakes (photo not available), made in the form of a helix, that are screwed into the ground.

John Elliot showed some of his recent projects. Pictured above is the underside of an oxy-acetylene flame cutting straight edge. The welding rods attached to the bottom allow the flame from a cutting torch to easily flow under the device. The bent bolt handle prevents the heat from scalding the torch operator.

Shown in the right photo is John's shop-built mobile frame for his chain hoist.

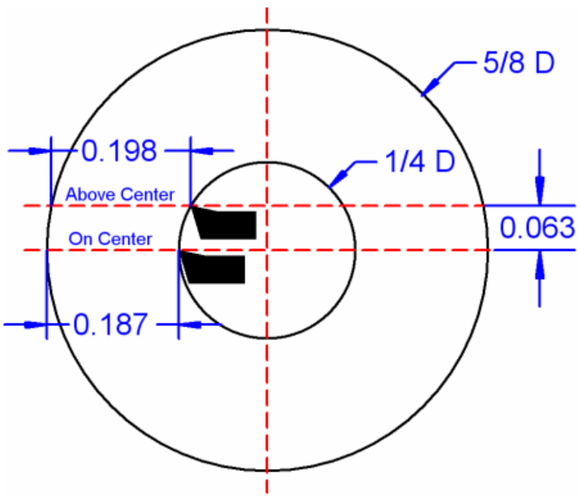
Novice SIG Activities

Single point cutting tools were reviewed. SIG coordinator Rich Pichler brought several dozen tool bits obtained at a garage sale. These bits were the product of a lifetime of preparation by a working machinist. The group tried to identify what the long gone mechanic tried to accomplish with each bit and what was its cutting direction.

Articles

Boring Problems

By *Dick Kostelnicek*



The drawing depicts an axial view of a ¼-inch drilled hole that is to be bored out to 5/8-inch in the lathe. This job usually starts with a light clean up pass by a boring bar in the ¼-inch starter hole. Drilled holes are often not round nor are they right on size. The trued diameter is then accurately gauged with an internal micrometer. The DRO (Digital Read Out) or the cross slide's hand wheel collar is set to the measured diameter so that the remainder of the material, 0.187-inches on radius, can be removed by successive passes of the boring bar.

Problem #1 Sounds just the way it ought to be. Right? Well, here's what can go wrong. The lathe operator forgets, or doesn't think it's even necessary; to set the tool-bit's cutting edge exactly to center height. Getting the bit right "On Center" is difficult enough since there is no convenient place from which to measure its height. When work is chucked, aligning to a dead center held in the spindle is out of the question. To make matters worse, the horizontally scribed center mark on the tailstock ram is out of reach.

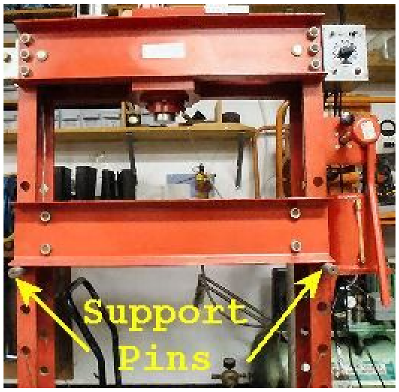
In a small starter hole, you may intentionally place the boring bar's cutting edge "Above Center" to provide additional clearance for the bits front face. Here's what happens when the bit is just a mere 1/16-inch "Above Center." Stock is removed till the indicated reading is 0.625-inch D (the bit has moved out 0.187-inch) and we "mic" the resulting diameter. It's found to be under size by 0.022-inch. The drawing indicates that an "Above Center" bit must travel 0.198-inch to produce a 5/8-inch hole or 0.011-inches farther then the 0.187-inches along the centerline. In other words, the "doughnut's" horizontal thickness increases above the centerline. So, to reduced frustration, keep the bit on center whenever possible!

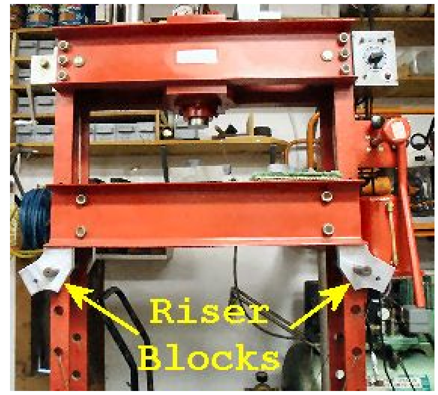
Problem #2 You've been pulling chips from bar stock all day and maybe even done some external threading. Now, you switch to internal boring. You do all the right things, as explained above, but the finished hole is still 20-thousands short of full diameter. What's the problem? "Lash Back" in the compound slide. During external stock removal, the compound was pressed back toward the lathe operator and all the slack between its lead screw and nut was taken up. When you switch to boring, the bit is reversed, facing the operator. The compound's slack must be taken up in the opposite direction, forced away from the operator. If you forget to do this, pressure exerted on the boring bar will push the compound back, thereby reducing the amount of material removed compared to that indicated by the cross slide's movement.

Now, I consider myself as an old hand at boring in the lathe. But, I succumbed to both Problems #1 and #2 recently while helping a new acquaintance enlarge some holes. And yes, I know quite well that swinging the compound in line with the lathe's axis or locking its gib is the tried and true way to prevent a "Boring Problem" from occurring.

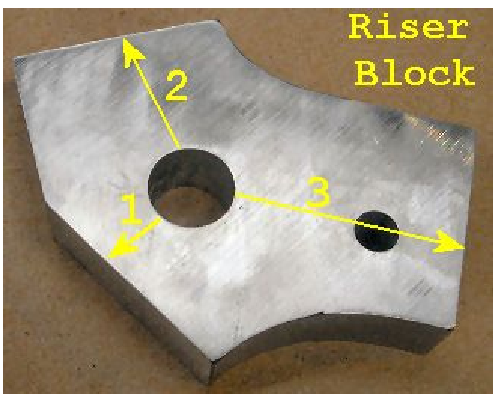
Height Adjuster for a H-Frame Press

By *Dick Kostelnicek*





The height of the horizontal table channels on my H-frame hydraulic press could be adjusted only by 4-inch increments. The channels rest upon support pins placed in holes spaced along the vertical frame members (left photo). This 4-inch coarse adjustment makes it difficult to perform some tasks such as broaching, where full ram travel is required regardless of the table's vertical position. In the past, I've used shims to take up the gap between the ram's face and the presswork. But, that's both an unwieldy and dangerous practice. Commercially built presses are often fitted with a screw jack nested within the ram to make up any gap. Mine is home built, *sans* ram jack.



In order to refine the height adjustment of the table channels, I made four identical riser blocks from 1-inch thick aluminum that slip over the support pins (upper right photo). Each block has three flat faces that can support the table channels. The flats are spaced 120 degrees apart, and are located 1, 2, and 3-inches respectively above the top of the support pin's hole (left photo). Rotating these blocks through the three positions, or removing them entirely, allows the height of the horizontal table channels to be raised by 1- rather than 4-inch increments.

Because the riser block is asymmetric, it is not balanced around the support pin's hole. Elastic bands, cut from a tire's inner tube, keep the blocks from rotating under their own weight when the table is lifted and the blocks have been turned to a new position (right photo).

I know you're wondering about the second smaller hole in the riser block. The blocks were band-sawed, faces milled flat, and curves drum sanded as a stack of four. The small hole contained a dowel that aligned the stack during fabrication.