Home Metal Shop Club

July 2013
Newsletter

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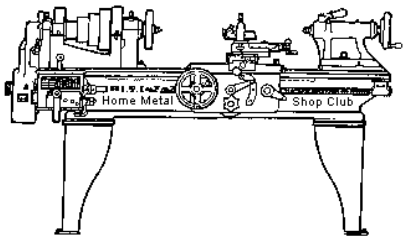


http://www.homemetalshopclub.org/

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

Our members' interests include Model Engineering, Casting, Blacksmithing, Gunsmithing, Sheet Metal Fabrication, Robotics, CNC, Welding, Metal Art, and others. Members enjoy getting together and talking 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 ***general announcements***, an ***extended presentation*** with Q&A, a ***safety moment***, ***show and tell*** where attendees share their work and experiences, and ***problems and solutions*** where attendees can get answers to their questions or describe how they approached a problem. The meeting ends with ***free discussion*** and a ***novice group*** activity, where metal working techniques are demonstrated on a small lathe, grinders, and other metal shop equipment.

President	Vice President	Secretary	Treasurer	Librarian
Vance Burns	*Norm Berls*	*Joe Sybille*	*Emmett Carstens*	*Dan Harper*
Webmaster/Editor	Photographer	CNC SIG	Casting SIG	Novice SIG
Dick Kostelnicek	*Jan Rowland*	*Dennis Cranston*	*Tom Moore*	*Rich Pichler*

This newsletter is available as an electronic subscription from the front page of our website. We currently have over 456 subscribers located all over the world.

About the Upcoming 10 August Meeting

Our speaker will be Dick Kostelnicek who will discuss and demonstrate how to remove the discoloration of stainless steel after welding. Also a video on The History of Welding will be shown.

General meetings are usually held on the second Saturday of each month at 12:00 noon at the Jungman Library, located at the intersection of Westheimer Road and Augusta Drive (west of the Galleria) in Houston, Texas. Visit our website for up-to-the-minute details, date, location, and presentation topic for the next meeting.

General Announcements

Videos of recent meetings can be viewed on the HMSC website.

The HMSC has a large library of metal shop related books and videos available for members to check out at each meeting. The library is maintained by the club librarian, *Dan Harper*. These books can be quite expensive, and are not usually available at local public libraries. Access to the library is one of the many benefits of club membership.

We need more articles for the monthly newsletter! If you would like to write an article, or would like to discuss writing an article, please contact the Webmaster Dick Kostelnicek. In the September, 2012 HMSC board meeting, the board elected to waive membership fees during the next membership renewal cycle for those providing newsletter articles.

Ideas for programs at our monthly meeting are always welcome. If you have an idea for a meeting topic, or if you know someone that could make a presentation, please contact Vice President Norm Berls.

Recap of the July 13 General Meeting

By *Joe Sybille*, with photos by *Jan Rowland*

Twenty six (26) members and two (2) guests, Oliver Bellwood and Chris Harrell, attended the noon meeting at the Jungman Library. President *Vance Burns* led the meeting.

The club has funds to purchase new books for the library. If you have suggestions, contact the Librarian, Dan Harper.

Presentation

Club member *Dick Kostelnicek* gave an informative presentation on welding in general and he concentrated on GMAW (Gas Metal Arc Welding) and FCAW (Flux Core Arc Welding) short-circuit transfer method that is employed in most portable wire feed welders.

He went on to explain how he transformed a basic 120V Century welder into one with the enhanced features found in the top line models. A Lincoln Electric video excerpt was also shown describing GMAW welding tips.

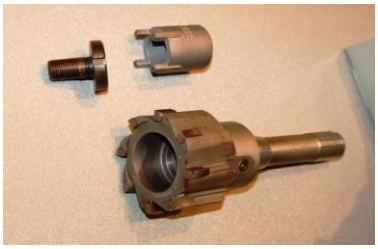
Here is the link to Dick's presentation slides.

Safety Moment

Alan May warned members about over pressuring *see-through* tanks to test for leaks. There is a risk of exceeding the elastic limit of the tank's material.

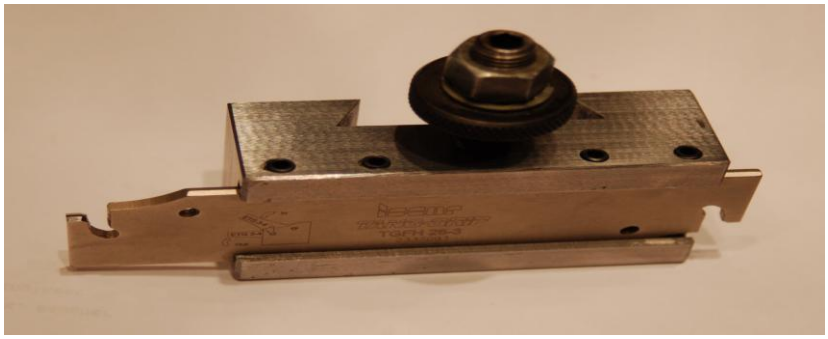
Vance Burns explained why welding cylinders are hydrostatically tested rather than pneumatically tested. A failure of a cylinder under hydrostatic testing would leak water, since water, the usual fluid for hydrostatic testing, is for all practical purposes incompressible. A failure of a cylinder under pneumatic testing would lead to catastrophic consequences, since air, the typical medium for pneumatic testing, is compressible.

Show and Tell



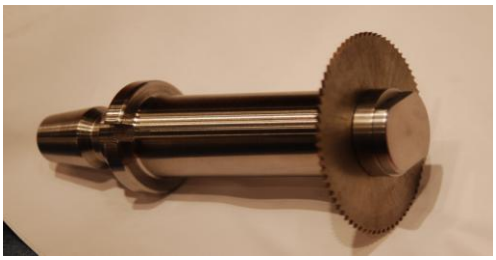
Dick Kostelnicek has a face mill cutter with a negative rake. He had difficulty tightening the bolt that secures the cutter head to a R8 arbor. Dick made a tool having four silver soldered projections on an annealed hex nut socket to facilitate tightening securing bolt (left photo).

Joe Williams brought in two tools from his extensive collection. One was a screw holder with a tapered shaft to grip a screw (right photo).

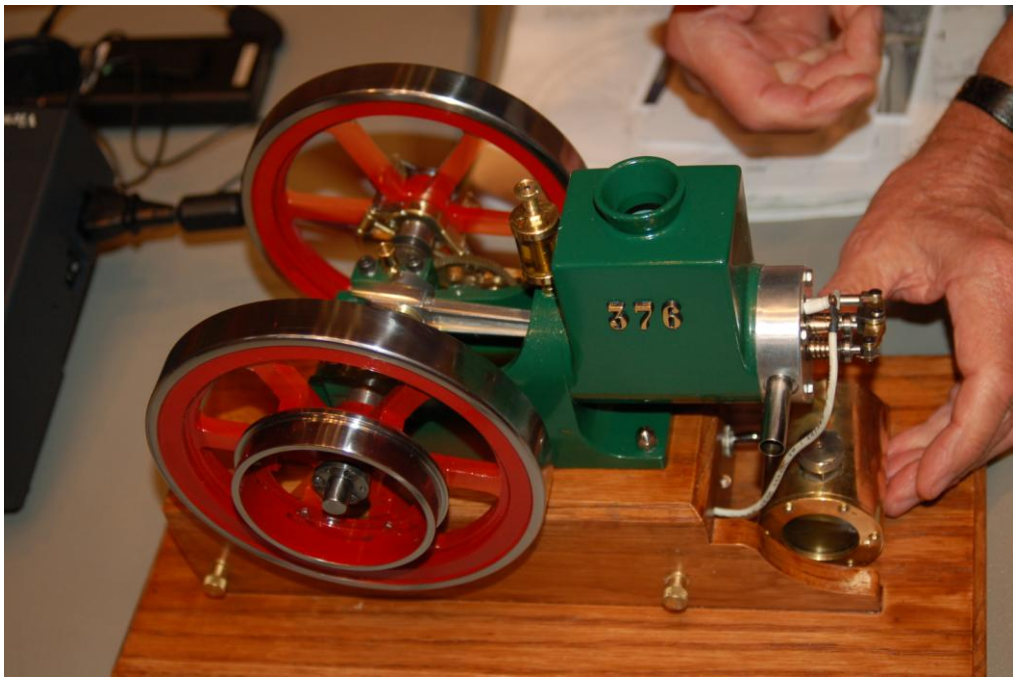


The other was a screw pitch gage with an attached 60 degree center gauge (above right photo).

Martin Kennedy talked about two projects. The first was an Aloris-type tool holder for a new Iscar cut-off tool (left photo). When he made the holder, he accidentally drilled a hole in the wrong place. He described how he plugged the hole with a threaded rod after applying permanent thread locking compound. He then re-drilled and tapped the hole in the correct location. See (www.aloris.com).



The second project was making three quick-connect tool holders for the Royal Quick-Change Tool System on his mill. The dimensions of the tool's tapered arbor were critical for a tight fit, and were very hard to measure. Martin made a gauge to determine the geometry of the tool holder, and kept modifying it until it exactly fit a commercially made tool holder. He then made three tools - a drill chuck holder (upper left), a cut-off saw holder (upper right photo), and a fly cutter (right photo) using the gauge to check dimensions while machining the tools. All three fit accurately the first time, without the need for further machining. See (www.royalprod.com).



Alan May brought in his model engine called the 'Farm Boy Hit and Miss 4-Cycle Engine' designed by www.jerry-howell.com. This little engine runs on acetone, and Alan built it from the model plans. Alan spared no detail, as one can see from the picture. The engine is designed to use an 'O' ring on the piston instead of normal cast iron piston rings. Without a load, the Farm Boy will turn between 20 to 30 revolutions between Hit and Miss firings.

Dan Harper talked about two projects. The first was making a one degree taper for a driver head under construction. The second was making taller jaws for his vice.

Problems and Solutions - *Ask the Blacksmith*

A member said that he had a problem with ascertaining the force exerted by his hydraulic press. One solution offered was to use a load cell to directly measure the cell's pressure along with its area. Multiplying the pressure by the load cell's piston area gives the force exerted. If an arbor press is employed, then the force is the determined from the force applied to end of the handle (moment arm) times the ratio of the handle length divided by the rack gear's radius.

Another member had some tallow tree stumps to remove and was having difficulties making a homemade stump grinder. He used the body and motor of an unused hand grinder. A cut-off saw attached to the shaft of the motor proved no match for the tough tallow tree stumps. The motor would run for about two minutes and then stop. It appears the motor lacked sufficient torque to cut through the stump. Solutions offered were renting a stump grinder and filling holes in the stump with nitrogen fertilizer to rot the stump.

One member requested ideas on how to clean a welder's leather apron. He did not want to send the leathers to a dry cleaner because the costs to dry clean would be more that the deal he got at the garage sale. Cleaning suggestions varied from using soaking in odorless white gas to using soap and water.

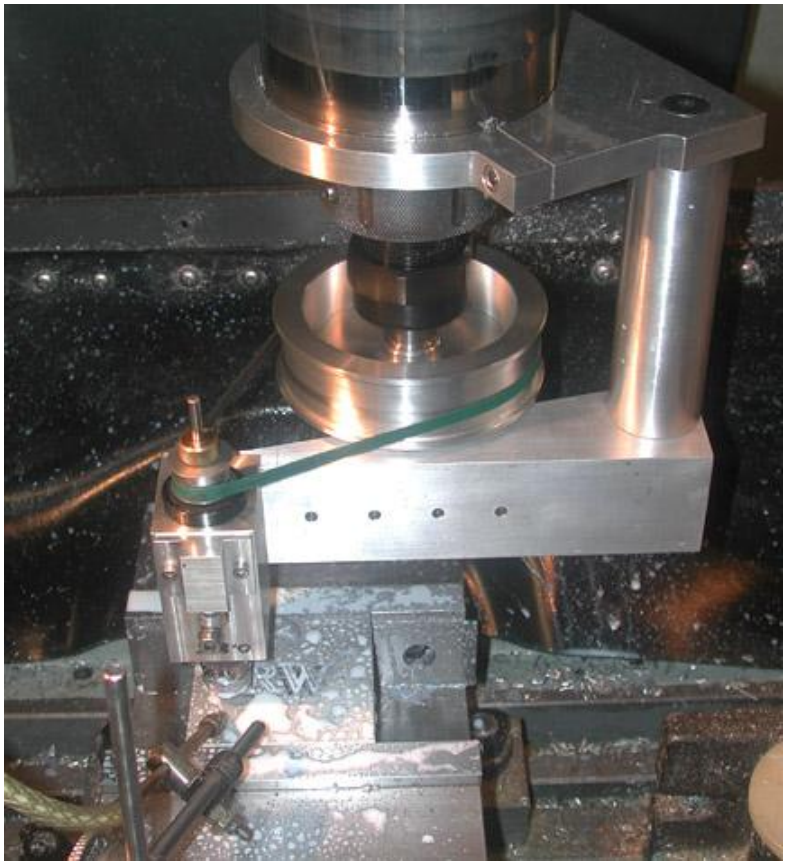
Novice SIG Activities

Rich Pichler and the novice group demonstrated a portable welder and assorted welding supplies.

Articles

Engraving Tool Drive Assembly

By *J. R. Williams*



This project started when I was given an old spindle unit from a commercial engraving machine (New Hermes). Now I have a spindle unit with a dull engraving tool and no way to drive the unit. My milling machine is capable of around 3500 RPM and this is not enough for a small engraving cutter. The next move was to devise a way to drive the unit with my milling machine. The drive's large pulley started as 5 inch diameter bar and has a ¾-inch shaft that goes into the collet holder. The pulley finished out at 4.226-inch in diameter and the quill drive pulley on the engraving unit is 0.816-inch diameter. The result: a spindle speed of 18,125 RPM with a mill speed of 3500 RPM.

The supporting assembly is clamped to the lower bearing flange on the mill's quill. This flange is about 5/16-inch larger in diameter that the quill. A 1-1/4-inch aluminum cylinder attaches to the upper clamp and to a section of 2-inch aluminum angle. A rectangular block of aluminum was bored to hold the spindle housing and mounts to the aluminum angle. The engraving spindle unit has an adjustable nose so it can contact the surface of the work to maintain a uniform depth of cut. On the front side of the spindle block, there is a spring holder that pushes down on the quill assembly. No dimensions are given as the parts will change with different mills and spindle unit.

The first operation at driving the spindle was with the smooth side of a small timing belt but there was too much vibration. So, the purchase of a small width endless belt was necessary. An "O" ring was tried as a belt but it could not handle the high speed.

Machining the large clamp unit was an ordeal. After the clamp unit was machined and the installation process started there was a big surprise - it was too big. I had made it one inch too large in diameter. There is a lot of work in the clamp assembly as it has two small flanges that fit over the quill flange for alignment and to prevent it falling off.

The spindle unit can be used with the installed nose section to limit the cutter depth or it can be fixed in order to allow the mill setting to determine the depth of cut.

This has been an interesting project.

Repair Your Portable Welder

By *Joe Sybille*

An inoperative portable welder need not remain so. Remove the cover(s) and turn it on. Exercise caution around live circuits. Listen for strange sounds and be aware of unusual odors. Look for obvious problems such as components that appear discolored or broken. Now, with the power off, use an ohm-meter to check the continuity of components such as resistors, diodes, transistors, relays, etc.

In my case, I had a Lincoln Weld-Pak 100 welder (left photo) with a feed motor that would not rotate to advance the electrode wire. Connecting 12 volts DC directly to the motor revealed that it worked, so the problem had to be in the electronic circuitry that drives the motor. Examining the wires and components on the circuit board revealed a cracked (open circuited) 2.7 ohm cement (wire wound) resistor and a burned (abnormally high resistance) 33K carbon composition resistor (photo below). I replaced these two components, re-installed the printed circuit board, and turned on the welder. Replacing those components resolved the problem.

Methodical checking of components was the key to resolving my welder problems. The same process may work for you.