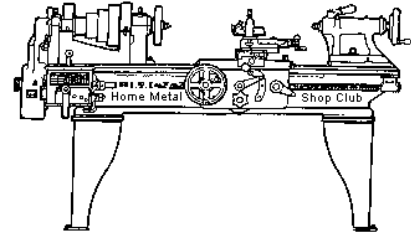




December 2021
Newsletter

Volume 26 - Number 12



<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 <i>Vance Burns</i>	Vice President <i>Ray Thompson</i>	Secretary <i>Joe Sybille</i>	Treasurer <i>Gary Toll</i>	Librarian <i>Ray Thompson</i>
Webmaster/Editor <i>Dick Kostelnicek</i>	Photographer <i>Jan Rowland</i>	CNC SIG <i>Martin Kennedy</i>	Casting SIG <i>Vacant</i>	Novice SIG <i>John Cooper</i>

This newsletter is available as an electronic subscription from the front page of our [website](#). We currently have over 1027 subscribers located all over the world.

About the Upcoming 08 January 2022 Meeting

The next general meeting will be held on 08 January 2022 at 1:00 P. M. on-line at Zoom.us. A week before the meeting check <http://www.homemetalshopclub.org/> for the meeting ID and passcode to join the on-line 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. These books can be quite costly and are not usually available at local public libraries. Access to the library is one of the many benefits of club membership. The club has funds to purchase new books for the library. If you have suggestions, contact the [Librarian Ray Thompson](#).

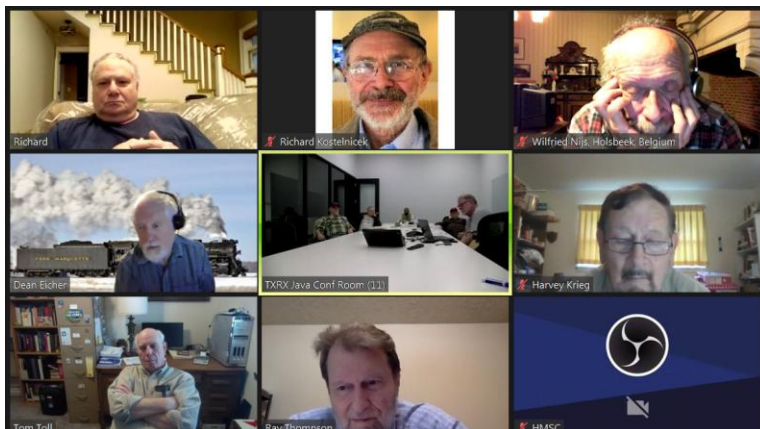
We need more articles for the monthly newsletter! If you would like to write an article, or would like to discuss writing an article, please contact the [Webmaster Dick Kostelnicek](#). Think about your last project. Was it a success, with perhaps a few 'uh ohs' along the way? If so, others would like to read about it. And, as a reward for providing an article, you'll receive a free year's membership the next renewal cycle!

Ideas for programs at our monthly meeting are always welcomed. If you have an idea for a meeting topic, or if you know someone who could make a presentation, please contact [Vice-President Ray Thompson](#).

Members are requested to submit to the club secretary the name, address, telephone number, and website address, if any, of any metal or other material stock supplier with whom the member has had any favorable dealings. A listing of the suppliers will appear on the homepage of the club website. Suppliers will be added from time to time as appropriate.

Recap of the 11 December 2021 General Meeting

By Joe Sybille



Five participants attended the in-person meeting at TxRxLabs. They live streamed the meeting to eight participants attending virtually.



There was one visitor, Wilfred Nijs, of Brussels, Belgium. President Vance Burns led the meeting (right photo).

Presentation



Club member John Cooper gave a presentation on using a plasma cutter. He began by describing what it is and why we use it. A race car builder enthusiast, Cooper required a means to cut metal of varying thicknesses. Early on, he knew there were many different tools available to cut metal. Included among the tools were a circular saw with a metal cutting blade, shear brake, oxy-acetylene torch, water-jet machine, table top laser, plasma cutter, and electric discharge machine (EDM).

Of the aforementioned tools, the plasma cutter offered the convenience of low power requirement, portability, ease of use, and required a small space for storage. Major components of the plasma torch include nozzle, electrode, and gas baffle. The metal to cut must be electrically conductive and properly grounded. Once set up with a power source and air supply, place the nozzle near the surface of the metal to cut and just pull the trigger. It is literally just that simple to use the plasma cutter to begin cutting. Free hand cutting is achievable with a steady hand. A guide comes in handy for straight cuts. Moving the torch too fast will prevent full penetration cuts through the metal. Moving too slowly will create excessive dross along the kerf. Warpage of the cut metal due to excessive heat has not been a problem so far.

The thickness of the metal to be cut determines the power level of the plasma cutter. In Cooper's case, his plasma cutter (Hypertherm Powermax 30XP) can clean cut up to 1/2-inch thick stock. It can sever 5/8-inch thick stock and pierce 3/8-inch stock. Higher power Hypertherm units can cut metal up to 1-3/4-inch thick. Clean cutting leaves minimal dross at the cut's bottom edge that can be removed easily before welding. Severing is the maximum thickness the plasma cutter will cut. However, this cut will leave near the bottom edge a bead of dross that must be removed before welding or other use. Piercing is the ability of the plasma cutter to commence the cut perpendicular to the metal. A clean cut requires the cut to commence at an angle.

Clean dry air is essential to plasma cutting. Cooper added a silica dry system to his air system to supply the plasma cutter.

Before purchasing the Hypertherm plasma cutter, he considered the Chinese imports. Of concern to him were service of the machine, spare parts, and availability of consumables. In the end, he concluded it would be easier to get those things from a domestic product.

Cooper's plasma cutter is shown in the photo at right.



Safety Moment

The safety video shown emphasized the importance of safe operation of a forklift. Never exceed the lifting capacity of the forklift. In areas where there are obstructions blocking the view of the forklift operator, always have a spotter to assist.

Show and Tell

John Cooper showed several pictures of items and techniques used in his shop. See illustrations below.



*Illustration 1:
Cooling fluid used in
welding coolant
system*



Illustration 2: Alternative to 45 degree joint



*Illustration 3: Lifting sling for
cabinet*



*Illustration 6:
Metal shims with
magnets*



*Illustration 4:
Storage cabinet for
flammables*



Illustration 5: Base for metal bender



*Illustration 3: Project drawings
storage cabinet*

Richard Douglas exhibited a cap, backpack, and insulated cup won as a result of his entry into a Wilton Vise sweepstakes.

Wilfred Nijs displayed several pictures of parts of his farm tractor on which he had to replace a throwout bearing. See photos below.



Problems and Solutions

A member requested suggestions on how best to make deep holes in a piece of square metal stock. The holes must be 14 ½ inches deep by ½ inch diameter. Suggestions included using a single flute drill bit to make the holes.

Articles

The Driver Makes All the Difference

by Joe Sybille



Similar looking screw heads require different drivers to achieve maximum applied torque to the screw. Take the ubiquitous Phillips head screw. There is a similar looking screw called a positive drive or Pozidriv screw (left photo). A quick glance at both screws will reveal little difference between the two. A closer look at them will reveal important differences between the two and this difference serves as the point of this short note.

Looking down at the head of a Phillips screw one sees two slots arranged in a cross pattern resembling a plus sign. The width and length of the slots determine the size of the driver required to tighten or loosen the screw. Common sizes are

Nos. 1, 2, and 3. Difficult to see is the conical shape of the plus sign at the bottom of the screw head. The conical shape allows one to tighten a screw and after reaching a certain torque limitation, the driver will slip out of the screw head. This limitation is by design and is called [cam out](#).

Similarly, looking down at the head of a positive drive screw, one sees again two slots arranged in a cross pattern resembling a plus sign. In addition, one will also see a four pointed star centered on the plus sign. Unlike the Phillips head screw, the Pozidriv screw offers more points of contact between the driver and the screw. Also unlike the Phillips head screw, the sides of the slots in the screw head tend to be parallel from the top to the bottom. The additional contact surface area facilitates the application of more torque to the screw.

The next time you have trouble tightening or loosening what appears to be a Phillips screw, check the screw driver. If the screw driver will not fit in the screw, the driver is likely a Pozidriv screwdriver. This driver will not fit in a Phillips screw. On the other hand, a Phillips screw driver will fit a Pozidriv screw, albeit not as well as a Pozidriv one.