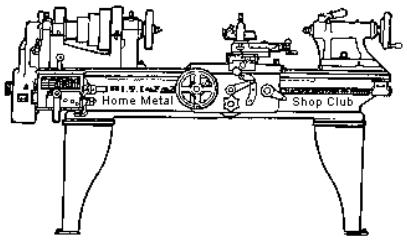
February 2014
Newsletter

Volume 19 - Number 2



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 8 March Meeting

HMSC member, Dan Harper will give a presentation on 'Threaded Parts'. The next general meeting will be held on 8 March at the Parker Williams County Library, 10851 Scaresdale Blvd. 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.

Club president Vance Burns requested volunteers to serve on the novice SIG committee. SIG leader, Rich Pichler, is stepping down. Gene Rowan volunteered to serve on the committee. Thanks Gene. Other volunteers are needed. A proposal offered for later consideration is to have the SIG group meet once every third meeting. Vance also mentioned a 90 minute video on 'Evaluating a used lathe'. A link to the video is available on the Links page under General Interest.

Recap of the 8 February General Meeting

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

Twenty two (22) members attended the noon meeting at the Hillendahl Library at 2436 Gessner in Houston, Texas. The membership included one new member, Warren J. Gloss. There were no guests present. 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 *Norm Berls* gave a presentation on 'Machine Moving'. This topic proved to be quite interesting and generated considerable feedback from the membership. Among the choices to move machinery were professional riggers, DIY (Do It Yourself), buy, build, rent or borrow moving tools, and hire a professional mover. Basic lifting tools include a forklift, pallet jack, pry bar, spud bar (aka digging bar), gantry crane, chain hoist, jib crane, engine hoist, hydraulic toe jack, rotating dollie, transport dollie, bottle jack, cable winch (aka come-along), and steel bars as rollers.

Some rigging tools include rope (non conductive), cable, chain, and slings.

Experience has shown that using steel chain on steel or cast iron machinery is prone to slippage. Additional useful rigging tools include Armstrong 'C' clamps (a clamp used by iron workers), load levelers, lifting slings, and tow straps.

One of the keys to a successful move of heavy machinery is to know the weight of the equipment to be moved and the capacity of the lifting equipment. The integrity of the surface over which the machinery will be moved must be known beforehand. Many planned moves have been interrupted because the surface caved in under the combined weight of the lifting equipment and the machinery being moved.

The use of eye-bolts as lifting aids can be helpful, provided the eye-bolts are rated for the anticipated load. Wood sleds are useful for increasing friction to slow the movement of equipment. Pry bars are useful to avoid slippage while positioning equipment.

Moving up or down inclined surfaces requires special caution. The movement of the equipment must be controlled, and slowly is the operative word here. Sudden uncontrolled fast movements of equipment usually result in damage to the equipment or nearby structures or serious injury to persons involved in the moving operation. There can be no guesswork, and sufficient help must be available. Movement of machinery is a complex operation requiring utmost attention to details.

Lastly, despite taking precautions, sometimes mishaps occur at inopportune times. If a load one is moving breaks free, the first response one should take is to move to a safe area out of 'harms' way. Equipment can be repaired or replaced. Nearby structures can be repaired. Risking a serious injury isn't worth the salvation of an errant piece of equipment.

In conjunction with Norm's presentation, Martin Kennedy gave a brief presentation on his experience moving a model 3500 Monarch lathe to his garage. He described painting the lathe in a previous article.

Here are links to both Norm's presentations and Martin's presentation.

Safety Moment

Vance Burns showed pictures of a person injured fatally while operating a lathe. It appears as if the operator's clothing became entangled on a bar chucked in the revolving spindle.

Larry Sequine cautioned those present to exercise caution when grinding, welding, or performing any operation that creates dust or mist. Larry received a lung transplant recently and is a living testament to the harmful affects of dusts and mists. Larry, good luck with your new lungs. HMSC members wish you well during your recovery.

Dan Harper reminded the members to pay close attention to their eyesight. The use of magnifier glasses lessens eye strain and enables one to see the seemingly too small print on tools.

Show and Tell

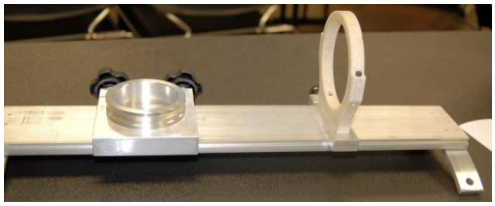
Vance Burns recommended a book: "Metalworking: Sink or Swim", by Tom Lipton, ISBN 978-0-8311-3367-7.

Dick Kostelnicek talked about a method to remove a pressed–in valve seat from an IC engine head (see article below). A weld bead around the inside of the valve seat, when cooled, will cause the seat to shrink sufficiently to facilitate easy removal (right photo).

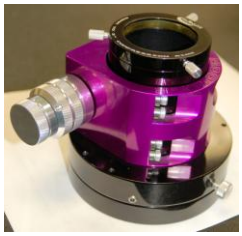
Dan Harper added to exercise caution when handling exhaust valve stems. He warned against cutting the valve stems, unless you know their make-up, to use for other projects. Some exhaust valve stems are filled with sodium ostensibly to improve heat dissipation.

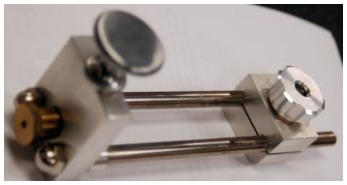
Joe Williams recommended checking motor starter capacitors for leakage. He showed a capacitor that had leaked (left photo). Joe also exhibited a set of rapid engagement tap drivers (right photo).

Martin Kennedy showed a tool that he made to polish the bottom of a hole. He die cuts a small disk of self-adhesive sand paper and attaches to the tool's face. His milling machine does the work of sanding.



George Carlson displayed a mount that he made to attach his camera to a telescope to take pictures of celestial bodies (left photo). He also showed the fine details of a commercially made focuser used by astronomers (right photo).





Stan Reeves showed a versatile gasket cutter that he made (left photo). Stan also discussed the availability of a DIY digital readout with Arduino and Android. Here is a link to a website describing the digital readout

William Odle showed an alligator pipe wrench. This tool was in common use years ago when fastener heads were square. This and other early tools can be viewed at this web site.

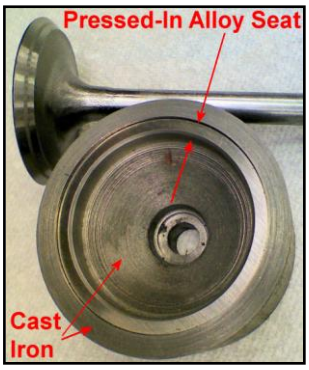
Problems and Solutions - *Ask the Blacksmith*

A member requested a name for round stock with two sections of different diameters. Several suggestions were offered, but none seemed acceptable to the member.

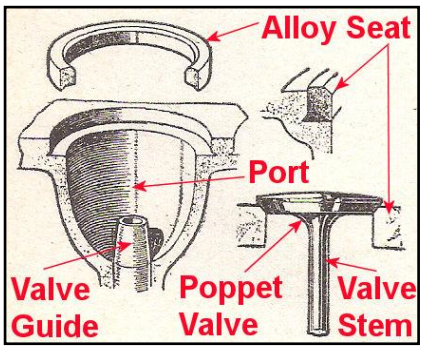
Articles

Heat Shrinking

By *Dick Kostelnicek*

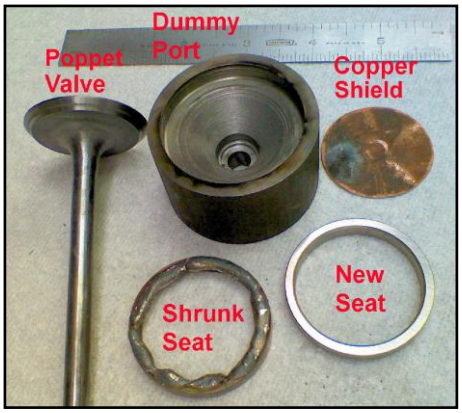


Recently, I learned about heat shrinking a steel part by welding. At the same time, I was interested in replacing an interference fit alloy valve seat in the cast iron cylinder head for an IC engine. The left photo shows a round 1.7550-inch OD alloy valve seat that was pressed into the cavity of a mock-up of a cast iron intake valve port (see right drawing). The hoop shaped seat is 0.2160-inch thick, 1.5000-inch ID and was pressed into the head with a 5 thousandth inch interference fit.



It's common practice to remove a valve seat from an engine cylinder head by milling it out. This requires careful positioning and rigid mounting of the head on the mill. However, if you weld a bead of metal around the inner surface of the seat, it is possible to shrink it. As the hot molten weld bead cools and solidifies, the seat will come right out from the cylinder head.

Prior to laying down a bead with a MIG welding gun, I placed a 0.03-inch thick copper shield disk inside the seat (left photo). The disk prevents the inadvertent welding of the seat to the cast iron head. Additionally, it prevents weld splatter from entering the head's port. The weld bead, around the inside of the seat, can be seen in the right photo.

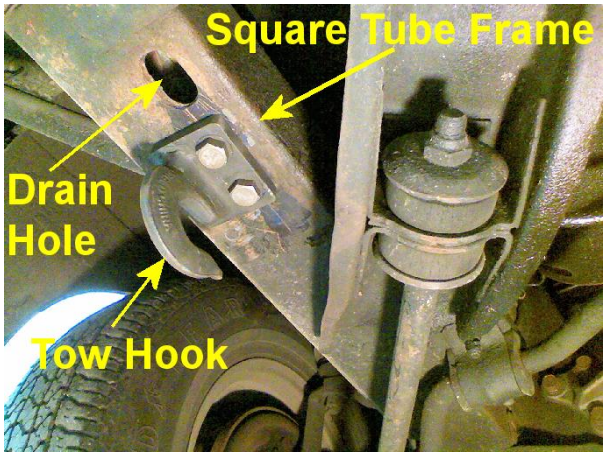


After inserting the stem end of the poppet valve through the back side of the valve guide hole (see upper right drawing), the copper disk was pushed out from the engine head. The copper disk, which was trapped behind the weld bead, pushed the heat shrunk seat out from its cavity. The measured OD of the seat after shrinking was 1.7432-inch, for about 12 thousandth inch shrinkage or 0.7% from the original 5 thousandth inch interference fit.

Milling-out a seat requires a rigid and, in my case, a tilted mounting of the engine head on the mill. Also, careful machining, both in radius and depth, is a must. Now, I prefer the heat shrinking method for seat removal since neither special care nor positioning of the cylinder head is required aside from a steady hand in welding.

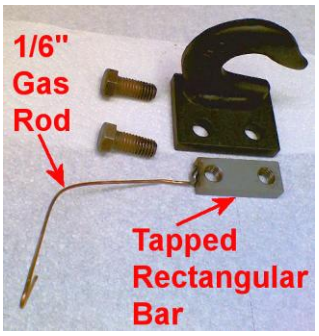
Bolting Blindly

By *Dick Kostelnicek*



I wanted to attach two tow hooks (left photo) to the square tubular frame members on the undercarriage of a vintage 1964-½ Ford Mustang automobile. The two parallel frame members, running between the front bumper and the mid section of the vehicle, are made up from bent sheet metal that is welded into 4-inch square tubes. I didn't want to pass the bolts completely through the tubing since tightening the bolts could crush them and prevent firm attachment of the hooks.

The tow hook assemblies were made from clevis hooks that were welded to a 1/4-inch thick square steel plates (right photo). Each plate has two 7/16-inch holes for bolting it through matching holes that I drilled in the square frame tubes.



The hollow frame tubes have a ¾-inch wide oblong drain hole (above photo) that allows ventilation, and thereby, prevents moisture from rusting the inside of the tubes. I couldn't use a wrench to hold the 7/16-inch nuts inside the frame tubes. So, I fashioned a rectangular bar with two side-by-side 7/16-inch tapped holes. I welded a 1/16-inch gas wedding rod to the bar in order to fish it inside the frame tube through the drain hole (see left and right photos).

I screwed two bolts into the internally placed tapped bar and tightened them using much more torque than would have been possible if the bolts were 5-inches long and passed completely through the square frame tubes. There was no need to hold the threaded bar to prevent it from rotating, as would be the case for a nut. As each bolt was tightened, its neighboring bolt prevented reactive rotation of the bar inside the frame tube.

This car has never needed a tow in its almost 50 year life. But, now I'm prepared for such an eventuality with two frame mounted tow hooks.