

Metro Detroit Metalworking Club

Newsletter

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NEXT MEETING

The May 1998 meeting of the Metro Detroit Metalworking Club will be held at the old fire hall at the Southfield Burgh historical site in Southfield, Michigan on Tuesday, May 26 from 7 to whenever.

Dan Hittenmark will bring in his CNC Sherline mill and give a demonstration on how it works.

The Historic Burgh Center is at the intersection of Civic Center Drive (10 1/2 Mile Rd) and Berg Rd. (Berg Rd is about 1/4 mile east of Telegraph Road between Telegraph and Lahser Rds.) The Burgh Center is on the North East corner, park in the Human Resources Center parking lot and walk north a couple of buildings (on Berg Rd) to the Old Fire Hall. (The Historic Burgh Center and old Fire Hall are about one and three quarters of a mile west on Civic Center Drive from the Southfield Public Library, where we have been meeting.)

Coming from Telegraph Rd turn East on Civic Center Dr. go about 1/4 mile to the traffic light at Berg Rd and turn North into the Human Resources Parking lot.

For more information on the club, contact our President, Bob Lorenz

MEETING NOTES

The April meeting at the old firehouse featured several presentations.

Brian Lawson described the procedure by which he made a replacement half-nut holder for his Atlas lathe. This involved some rather complex machining on his Bridgeport.

Larry Chenault gave two presentations. First, he described a small model airplane engine dynamometer under development by his friend Bud Kirk. Larry is assisting with the development of the control aspect of this instrument. Second, he discussed hand scraping, and is attempting to line up a speaker on this subject.

Bob Fuhrman brought in two engines for display. One, a small vertical steam engine, was built from plans in a 1930s issue of *Popular Mechanics*. Bob built this engine some time ago, without castings, using only his lathe and drill press. It runs on about 20 psi. His other engine, a more recent horizontal steam engine designed by Rudy Kouhoupt, runs on about 5 psi.

Richard Olejnik showed a shop-made spline for the spindle of a mill-drill.

Dan Hittenmark showed several wooden dominos made by burning the patterns into wood with a small torch. The making of these involves the use of a custom fixture which holds the domino and defines the full pattern of dots. In operation, the torch flame passes through the holes in this fixture to burn the dots. Fixture holes are masked off as needed by a hand-held mask.

Dave Farone described his success with a commercial "Paint over Rust" (POR) paint.

David MacMillan presented the history of his "learning experience" in making the Ed Warren "Lucy" transparent lucite oscillating engine. As that's me, I'll drop the third person here and briefly describe my presentation.

I have not yet completed this engine. What I've discovered is that although the plans are complete, there is much about the working of lucite that they don't discuss. The plans involve a "cylinder block" which is a small piece of 1/2 inch thick lucite (cast acrylic sheet). Into this block, a cylinder must be bored 0.250 inches in diameter and a bit over an inch deep. My first attempt at this was a failure. I simply chucked the piece in a very cheap drill press and attempted to drill the hole using a standard "jobber length" drill. This resulted in a hole that was out of square in two dimensions with a terrible surface finish. After some inquiry, I concluded that perhaps my setup was not sufficiently rigid. In my second attempt, I used the Sherline mill and drilled the hole using a 0.250 inch end mill. This worked fine until the mill advanced far enough into the work that it ran out of flutes. At that point, the swarf welded itself to the cutter and the hole, though straight, had an awful surface finish. One advantage of lucite as a material is that you can see your mistakes happening. For my third attempt, I moved to the Sherline lathe (for even more rigidity). I switched to shorter drills ("screw machine length"), and to drills that were ground "split point." These drills were also 135 degrees at the point, which is a feature whose merits in lucite are not clear. Most importantly for this third attempt, I added a cutting fluid. I hadn't been sure what to use on lucite, as oils often react poorly with plastics. I discovered, however, that WD-40 makes an excellent cutting fluid and does not appear to damage the plastic. This third try worked well enough, but not so well that I am satisfied with it.

I discovered that given the small size of the part and the relatively large size of the hole through the Sherline 4-jaw chuck (necessary as the part was rectangular), it was difficult to accurately align the part in the lathe by pressing a squared face against the chuck. To solve this problem, I spent perhaps too much time making a holding fixture for drilling/boring this part in the lathe. The fixture consists of a sort of a U-shaped bed into which the rectangular part fits, secured by a single screw. This U-shaped bed is mounted to a turned holder which fits, in operation, in the 3-jaw chuck. By turning different diameters on this holder to locate the bed, different hole centers are possible. (A picture would be appropriate here, but I haven't got one.) One advantage of this fixture is that it allows the workpiece to be drilled or bored with only one edge squared up. As only one of the four edges of the cylinder block need be square, this represents a savings in finishing the block. However, it was noted at the meeting that this was a lot of work for a single-purpose fixture. This is true, but it was also a good learning experience.

I finished this fixture the afternoon before the meeting, and only had time to drill a single test-hole with it. For my fourth attempt at a cylinder block I plan first to drill (undersize) and then to bore the cylinder. It will be interesting to discover the quality of the surface finish left by the boring operation.

The other major learning experience of this project has been discovering how to finish the edge of the lucite. When cut from the 1/2 inch (actually 12mm) sheet, the lucite edges are opaque. I found, first, that it was a good idea to square them by milling them. This left a regular, but still opaque surface. I then proceeded to polish the surface by rubbing it on various abrasive papers backed by a thick sheet of plate glass (for flatness). I used, first, silicon carbide "wet or dry" paper, wet, in grits of 220, 400, 600, 1000, and 1500. These last two grits are available from auto supply stores. This left a nearly clear finish. Then

I discovered a suggestion in the online plans for building George Carlson's "Crystal" acrylic engine, from the Houston Home Metal Shop Club at:

These suggested making an abrasive paper out of ordinary paper and "polishing compound." In my case, I used a stick of "white rouge" (from the tools department of a large home improvement store). This was rubbed on a sheet of ordinary paper as if it were a crayon, creating "rouge paper." This paper, used (dry) like the sandpaper earlier produced a transparent finish. The only difficulty I found with this entire procedure was that I couldn't keep the machined edges of the workpiece square through the polishing. I'm currently working on possible jigs for this, and will report more when one works.

Throughout my presentation, I received numerous helpful suggestions from the group - thanks to all! It was also pointed out that there was something odd about my success using 135 degree drills. Normally, softer materials such as plastics require a smaller drill point angle (90 degrees, for instance), not flatter (135 degrees vs. 118 for ordinary drills). However, in moving to these drills I changed not one but several variables (in lathe rather than mill, with cutting fluid, screw machine length on drills, split point on drills); any of these factors could easily be more important than the angle of the drill.

The meeting then concluded with the by-now normal door prizes and free-for-all discussions. The door prizes were donated by Dick Triemstra (a splendid Grade A granite surface plate which I did not win), Dave Farone (a can of "rust converter" paint-over-rust paint), and Brian Lawson (many bottles of ISO-68 way oil). Thanks very much to all of the donors!

- David M. MacMillan

NAMES 1998

One of the great advantages of living in or near Detroit is the proximity of the annual North American Model Engineering Exposition ("The NAMES Show"). This is the largest model engineering show in North America. Three of the members of our club are also members of NAMES. We haven't seen much of them lately, as putting on the NAMES show involves a tremendous amount of work --- they do an excellent job of it.

Several members of the MDMC met at NAMES, including our Fearless Leader Bob Lorenz, Jim Schrot, Jerry Harmon, Dave and John Kacir, Michael Latcha, David MacMillan, and a couple of others whose names escape me at the moment (my apologies). We were also able to meet our Arizona Internet member, Paul Pierce - Welcome, Paul! Club members Richard Triemstra and Dave Peregord had a vendor's booth at the show.

Both Bob and I got a chance to talk with Ron Ginger of the New England Model Engineering Society. I'd like to thank Ron for his thoughts on things to do in a model engineering club.

- David M. MacMillan

TAILGATE SALE

"The Early Engine Club tailgate sale will be held May 7th in the parking lot behind Lovett Hall next to

the Ford Museum. You can get to the parking lot by coming off Oakwood or Southfield rd. onto Village road which runs along the south side of the Village and the Museum. You then take the road just to the west of the Museum that runs between the Parking lot and the Museum. Go to the end of the Museum and then drive along the back side of the Museum and right into the Lovett Hall Parking lot. The sale will start about 5:30 and will run until dark. Everyone is welcome to come and buy or sell what every you want. You don't have to be member of the Early Engine Club. There is always a lot of interesting stuff." This information is from Earl Gage. I suggest we attend this swap meet rather than trying to put on our own.

- Bob Lorenz

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