Metro Detroit Metalworking Club

Sept '08

Beginning balance	766.96	President	Rick Chownyk
2007 dues income		V. President	Emil Cafarelli
Non-dues income		Treasurer	Ken Hunt
New balance	$766.96	Editor/Lib	James Howard
Expenses	-$0.00	Publisher	John Lee
Total on deposit	$766.96	Webmaster	Dan Hittenmark

DUES: $10/yr. check to **MDMC** c/o Ken Hunt,

Macomb Community College 14500 E 12 Mile Rd, Warren, MI
Room R-128 (parking off Martin Rd East of Bunert Rd
Next meeting: October 8, 2008 (2nd Wed of every month)

Presidents Message:

Although I can not speak for everyone, I sure had a great time at the club picnic! We had members of our own club as well as members from a few other clubs who joined us in the fun! The weather was good (for a change!) and although my yard was still a mess, everybody seemed to have a good time! Before I forget, I want to thank a few people. "Harley" Bob, for bringing those awesome cannons (sorry we could not shoot them!) and the great beans! Bob (sorry I forgot your last name!) for cooking up the hamburgers and dogs on the grill. Don Foren for helping me cleanup the yard (for 2 days BEFORE the picnic) and for doing a hot wire foam demo. All the other guys who brought food and snacks!!!! AND, my Wife, Sandra for all the help as well as putting up with me and all my "stuff" in the house and yard!!!! I hope that I can have my place a bit better for next year's picnic!!!! No program for this weeks meeting, so don't forget to bring your "show and tells". Any ideas for the November meeting? December meeting will be a Christmas party!! See ya at the meeting! Rick

Rick's Aluminum Casting made from styrofoam pattern

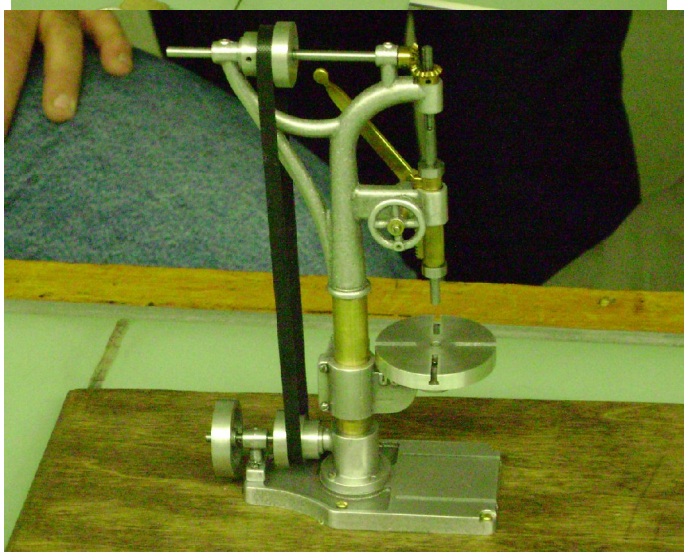
REMEMBER WE ARE NOW MEETING IN R-128

MDMC Minutes of 10 September 2008

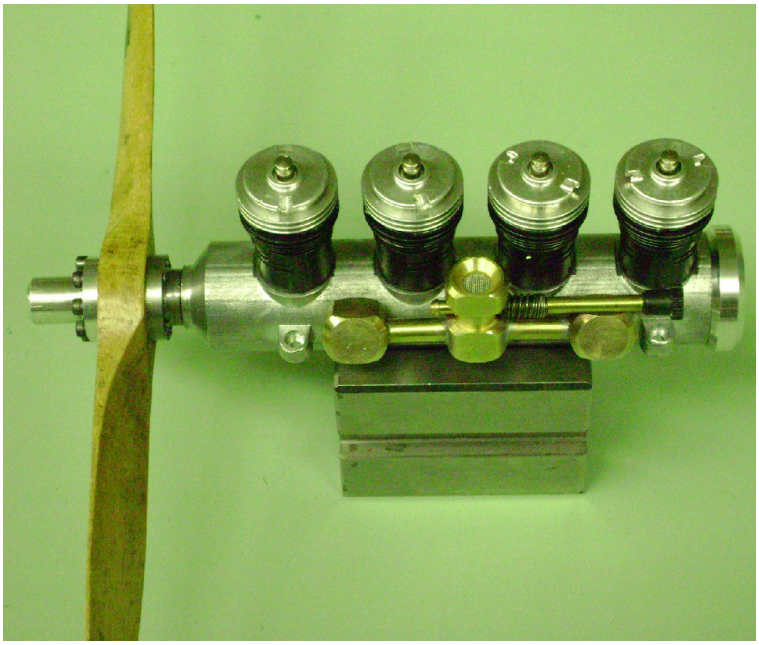
The meeting was opened by President Rick Chownyk at 7:30 PM. Ken Hunt indicated there was no treasurer's report available.

Rick Chownyk reviewed details of his picnic, its location, food plans and the planned presentation of the lost foam aluminum casting technique.

Ron Grimes demonstrated the drill press of his model Ford machine shop. He indicated that much of the construction required went well beyond the instruction sheet information.



Steve Huck brought in his model engine and indicated that he had acquired a block of solid aluminum from a friend and intended to rebuild the engine block.



Burt Campbell demonstrated one of several collars with both metric and inch markings.
Joe Pietsch presented pictures of and strongly recommended the Portland Old Engine Show.
Karl Gross reviewed his experience at a Dryden, Michigan barn sale. The owner lives in Royal Oak and his phone number is available from Mr. Gross.
James Howard, Metro Detroit Metalworking Club

Aluminum Casting using the Lost Foam Method:
This is the easiest and cheapest method I know of for making aluminum or other metal castings. An entire foundry can be constructed for less than $100. The furnace is made from a five gallon metal pail. Two inches of refractory cement lines the inside of the pail. If you are only casting lower temperature metals like aluminum or pot metal you could use a mortar mix. Foundry Products, in Westland, sells refractory cement. This is good up to about 3,200 F. The burner is made from a piece of water pipe and a small nipple with a #57 hole drilled. The furnace uses propane so you need a tank. The crucible can be made out of a metal pipe. If you can get your hands on some stainless steel pipe or tubing great, if not steel pipe will work. You will need plenty of beach or play sand to pour your casting. Metal buckets are used to hold your sand and patterns. Your pattern is made up of either blue or pink styrofoam. Simple shapes can be made with a hot wire cutter. You can drill holes and file or sandpaper the pattern to get more exact shapes. The styrofoam pattern for the aluminum wheels shown on the previous page were made using a CNC. The styrofoam part is attached to a pouring sprue. You can use white styrofoam for this if you like. Just remember, what you see is what you get. If you can see the bead pattern or scratches or nicks this is what you will get in the finished part. The pattern with the pouring sprue needs to be coated. If you do not coat the part, sand will become embedded on the surface of the casting. This will not only leave a rough texture with sand grains on the part, but will be very hard on cutters and drills .You can use textured ceiling compound for coating your pattern. Pour this compound through a fine screen to catch the small bits of styrofoam. Adding water makes this material like a fine mud that does not harden. You may coat the pattern with a paint brush or simply dip the part in the mud. If you wish, you can sprinkle fine sand on the part and let dry. Adding sand to the wet coated pattern will speed drying time and make the coated pattern more resistant to breakage. Fill your bucket with several inches of sand. Place the coated pattern in the bucket and surround it with sand. Drop or vibrate the bucket several times to insure the sand has compacted around the part. Make certain that your pattern has at least two inches of sand on top of the pattern. If there is not sufficient sand on top of the pattern molten metal could break through to the surface. This is what happened to the casting on the previous page. The front wheel on the bottom left shows where the metal burst through to the surface. This may or may not be a big deal on the part you are trying to cast. At the very least it will take some additional time to clean up the casting. The pouring sprue should be sticking through the sand. Cut out the top and bottom of a tomato paste can and place it over the pouring sprue. Make certain it is embedded at least an inch into the sand. The tin can acts to direct the metal to the pouring sprue and also as a metal reservoir that will add pressure and metal to the part you are casting. Rick uses a pipe in which he cut a slit on one side and used a hose clamp to tighten and close the slit .The advantage of this method is you can use this pressure head over and over again. With the tomato paste can you will have to peal off the can from the metal. Before pouring the aluminum skim off most of the dross from the top of the melt. THE BIG MOMENT. Pour your metal into the pressure head ie tin can. When you pour make certain you do not stop until metal starts to

fill the pressure head. You will see some smoke and flames at the pressure head. This is some of the styrofoam gasses burning off. Additional styrofoam gasses will pass into the dry sand. The molten metal will solidify as it cools. The largest section will cool last and that is where you will see visible shrinkage. You want the shrinkage to be in the pouring sprue and not in the part. This is why the pressure head diameter should be larger that the largest diameter of the part you are trying to cast. For more complex parts you may need to add risers to the part. What if you end up with a bad casting? Many parts may still be useable even if there are some cosmetic problems. There may be some extra work involved in finishing the casting. Small holes in a casting can be filled in with Bondo if you are going to paint the part. If the casting is really bad, no big deal, melt it down and pour another part. Try doing that on a mill or a lathe. When you screw up on a part you can't put the metal back, but in casting you can! In a short time you should be able to identify and correct defects to your casting. **In a nutshell you make a part out of styrofoam, coat it, place it in dry sand and pour molten metal. You now have your casting!** The only down side to this method is if you want another part, you need to make another styrofoam pattern. If it is a simple part this may not be much of a problem but if you want identical parts you are going to need to mould styrofoam, or a CNC machine. So this brings us to another juncture, how to make a simple and inexpensive CNC machine to cut styrofoam parts? ……to be continued.

Pattern is coated and sprinkled with sand to speed drying and to make the surface coating harder and therefore easier to store

Casting pulled out of the sand. The dark color is the coating which is burnt.

Burner for furnace. This is a piece of water pipe with some holes drilled into the side of the pipe. A nipple is inserted into this pipe and a small hole is drilled to allow the propane to escape.

The furnace with the burner in action. This is a 5 gallon metal pail lined with refractory cement. The lid is also made with this refractory cement.