The Bay Area Engine Modelers Club, Branch 57 of EDGE&TA

MEMBERSHIP
$25.00 US
Contact
Ken Hurst at
(707) 257-2481

The Crank Calls

Feb 2009

President	Don Jones	(510) 812-7006	dj712@sbcglobal.net
Secretary	Carl Wilson	(650) 967-7715	talleyho123@yahoo.com
Treasurer	Ken Hurst	(707) 257-2481	icengine@comcast.net
Events	Ken Hurst	(707) 257-2481	icengine@comcast.net
Tech Topics	Paul Bennett	(510) 247-3106	paulbennett01@comcast.net
Editor	Steve Jasik	(650) 322-1386	steve@jasik.com
Printer	Larry Zurbrick	(408) 448-5752	Lz_m57@pacbell.net

NEXT MEETING
Feb 21, 2009 at
Chabot College, building 1400
25555 Hesperian Blvd, Hayward 94545
Doors open at 9 AM
Meeting Starts at 10 AM

Upcoming Events
July 18-19 WEME in Vallejo

MEETING NOTES

Carl Wilson

We welcomed three guests to our January meeting: Gary Moore, David Caruso, and Alan Splithoff.

I deeply regret announcing the death of Al (Alphonse) Vassallo. Born in Malta on March 8, 1929 he passed away in Modesto on November 9, 2008. He worked for many years at Schlage Lock in San Francisco. He was an unusually talented machinist and inventor. Al built his first engine at the age of 16 and continued building engines all his life. He had the ability to make a rough sketch of his engines and then built them with no further drawings. He had it all in his head. Requiescat in pace, Al: we will keep you in our memories.

The club has now been recognized by both the State of California Franchise Tax Board and the Internal Revenue Service as a non-profit educational corporation. The first Board of Directors meeting will be held before our regular club meeting in February. We will elect the Chairman of the Board, adopt bylaws and conduct new business. The agenda of this and all subsequent meetings will be available by e- or snail- mail to anyone who requests a copy from the club secretary; also the minutes of all meetings.

George Gravatt and Dwight Giles have completed the refurbishment of the engine donated to the club by Ken Kelso. One of the business items for the Board of Directors will be to establish a procedure to be used by the club to sell donated items. We discussed this issue and the consensus of the club members present was that we set a minimum price and offer the item to club members by sealed bid. If the item does not sell to club members at that price it will be placed for sale on eBay. I will make this recommendation to the Board of Directors.

Mike Absher recommended that the club purchase a new printer for the newsletter. It was moved, seconded, and passed.

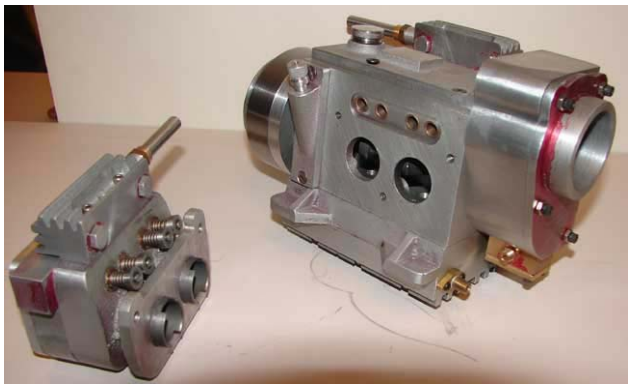
Joe Landau has placed the photos taken by Barry O'Connor at the 2008 WEME show on the show website http://baemclub.shutterfly.com/452 , and the videos by Don Jones on YouTube http://www.youtube.com/profile?user=EngineModeler&view=videos. Joe asks that you look for your model on each site and send him a note with your name and the name of the display. Joe also suggests that you can forward to him photos of engines that you plan to bring to the 2009 WEME show. He will place them on shutterfly for pre-publicity. Joe is at jrlandau@verizon.net and 408-354-4689.

Speaking of WEME 2009: the show directors have agreed to hold a two day show: July 18, 19. We now have sufficient funds that we should not have to ask the membership for seed money. On behalf of the show directors, the club membership, and our show guests I thank everyone who has contributed to making the show a success in 2007 and 2008.

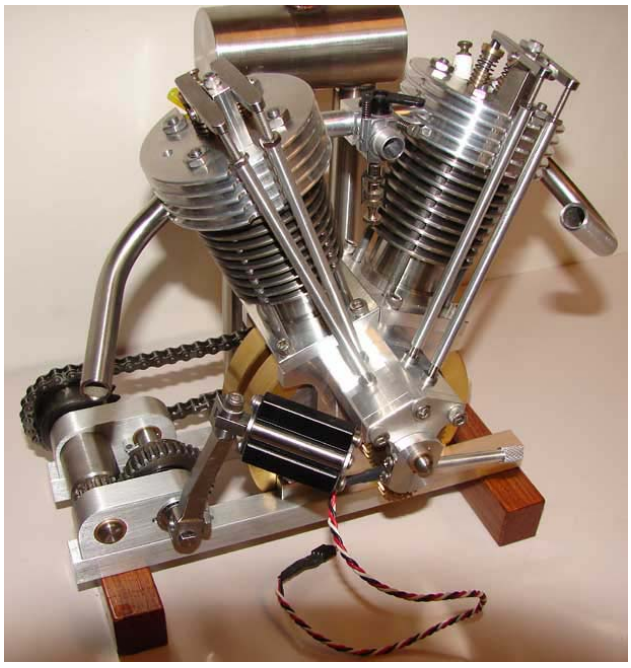
Darrio Mecchi brought up the tail end of the Red Devil engines in BAEM and with this he won First Pop Honors for the month of January. Darrio made a new piston to increase the compression and several modifications to the carburetor. He said that he made so many changes that he long longer knows which had the most effect in making this one a runner. Darrio is still working on the sensitivity of the governor.

Shannon Lile won First Silence Honors for his Rider-Ericsson engine. It is a ¼ scale model of an 8" cylinder water pumping engine that would have been used to pump water from a well or cistern to a storage tank higher in the building. A reciprocating pump circulated the water through the cold side of the engine before sending it on its way. This design dates from the years 1895-1915. Shannon said that it took a lot of work to reduce the friction to a level sufficiently low for the engine to run. Castings are available at: http://www.myersengines.com/Default.htm

Jaime Quevedo purchased this “Whatzit?” engine. There are no identifying marks and he guesses that it was built in the ‘30’s and intended for a boat. Jaime added piston rings and built the evaporative carburetor which he says improves low speed running.

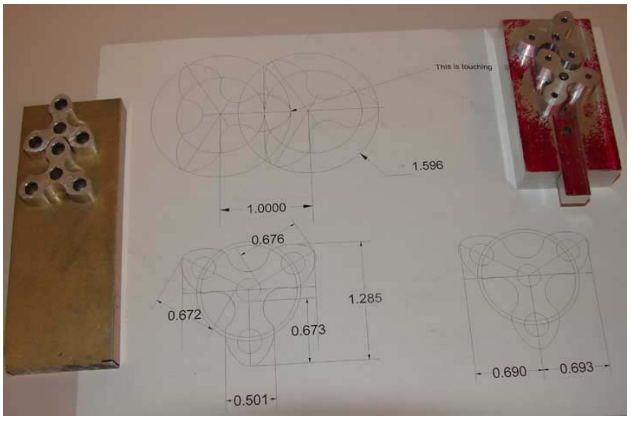


Jaime has his build of the Mastiff flat-four ready for assembly. Shown here are the crankcase and one of the cylinder blocks. Jaime drilled the crankshaft for lubrication and built a Hall Effect ignition trigger.



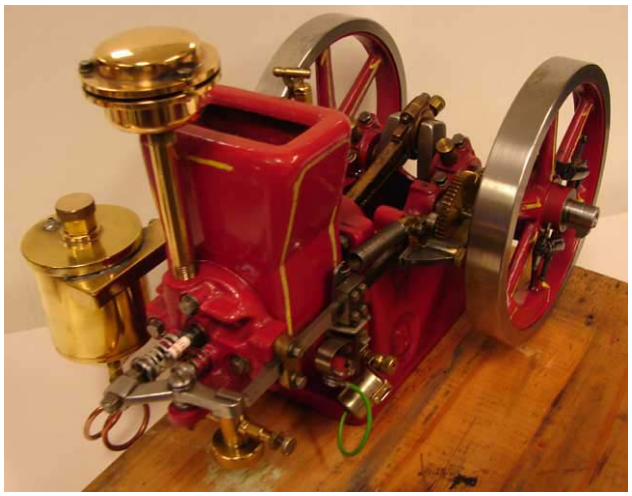
Lon Keith has his Hoglett ready to run: it just needs timing. The head gasket was carved from 0.014” brass stock and the gas tank was placed at the same elevation as the carburetor. Lon is well placed to take First Pop Honors next month.

Dwight Giles builds a lot of different things and works wood as well as metal. The ball peen hammer head is 4130 steel – quenched, but not tempered. The mallet soft faces are nylon, and the handles are eucalyptus wood.



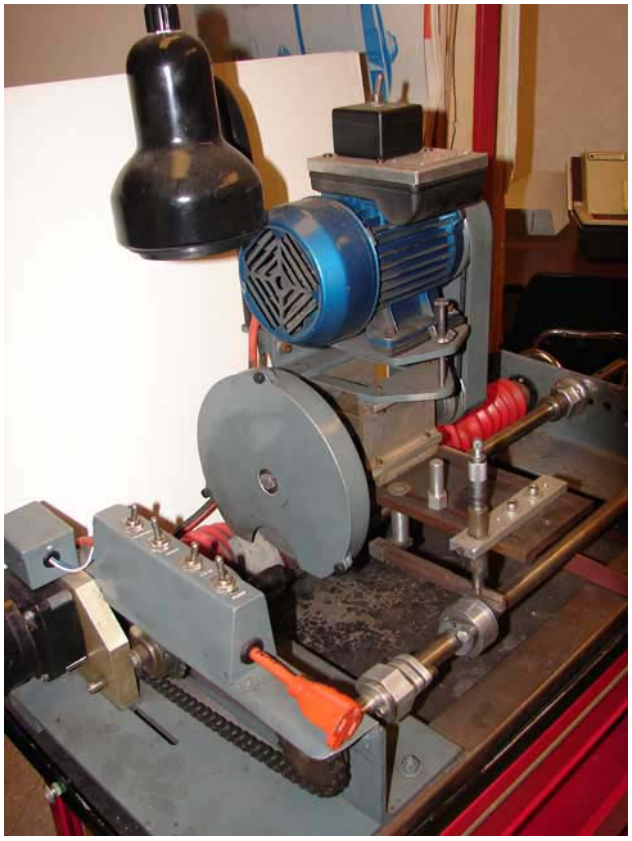
Jim Piazza has determined that he is going to build a Roots supercharger: these are the model rotors that he cut on his CNC mill. He received a point file that defined the profile of the lobe as a Word document, imported that into Excel, then into a two dimensional CAD program, next into Alibre 3D CAD, and then into G code for the mill. He has had to cut measure and tweak a bit, mostly due to errors in his milling machine. Jim plans to stack three ½” thick rotors using dowel pins in the holes in the lobes to make the complete rotor.

Steve Jasik noted that Jacques Littlefield, the world’s premier collector of restored military vehicles, passed away recently. The official website is http://jacqueslittlefield.com/



Bob Kradjian has donated this model of an Associated Hired Man hit-n-miss engine to the club for sale. Dwight Giles and George Gravatt promptly took charge of the engine to once again work their magic.

TECH TOPICS: CAM GRINDING



Ken Hurst brought his cam grinder, heavily modified from a design by Gene Switzer published in Strictly IC magazine some years ago. Ken estimated that this machine has successfully ground at least 50 cams. Must be doing something right for Dwight's and Ken's engines run super well. This design utilizes a 4 to 1 ratio geometric reduction. Ken lays out his master lobes at four times full size on aluminum sheet and then saws and files to the line. We'll get back to the master in a moment: first let's take a tour around the machine so you know where the major pieces are located.

Starting at the top it would be hard to miss the ½ horsepower electric motor driving the ball bearing wheelhead via a "V" belt. It takes that much power to swing the 7" grinding wheel. Ken says that changing from a ¼ hp motor driving a 4" wheel to the current setup saves a lot of time: there is more wheel circumference which requires fewer dressing cycles and the higher horsepower allows them to grind with a faster infeed. The workpiece (not currently installed) would be positioned directly beneath the grinding wheel and driven by the black shaft visible to the right of the switch box. The other end of the camshaft would be supported on the right by a center that is not visible. The camshaft is driven at about 20 rpm by a DC motor at the lower left.

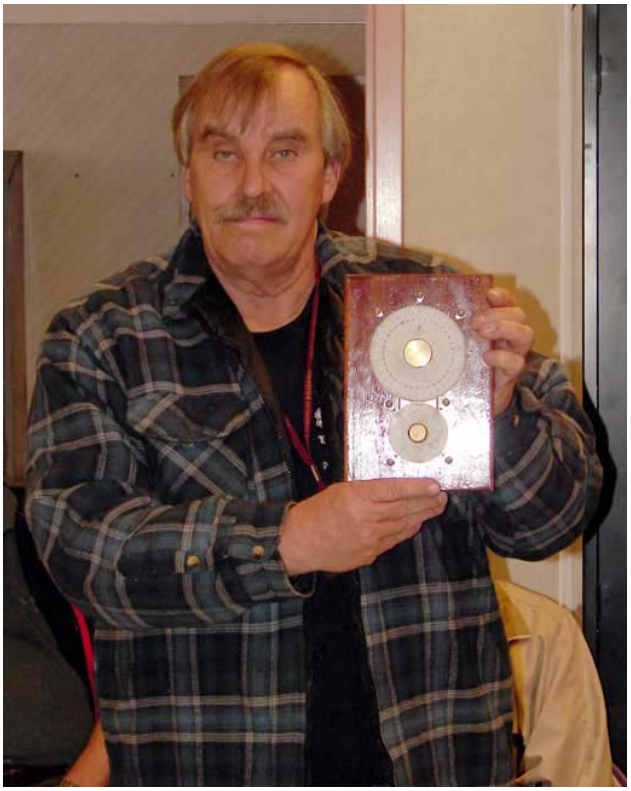
The grinding wheel must be positioned at each lobe along the length of the cam. This is done with a lead screw located within the orange bellows at the back which moves the wheelhead along its pivot shaft. The wheelhead oscillates up and down on its pivot (not visible) controlled by the shape of the master cam. One of these is visible at about the middle of the shaft at the front – immediately to the left of the aluminum cylinder which is the index mechanism. This device rotates the master cam to the angular position required for the lobe being currently ground. The follower for the master is the vertical cylinder with a knurled knob: a micrometer head which also adjusts the finished size of the cam. Note the roller chain which connects the master shaft and the camshaft. This keeps them in time and ensures that each lobe is ground in the correct angular position.

Let's grind a cam lobe, assuming that the setup has been completed. Turn on the wheelhead, then the workhead. The workhead motor drives the camshaft and in turn the master shaft at the

same speed via the roller chain. Look by of the front left corner of the wheelhead – that looks like a stop that holds the wheelhead in the raised, non-working position. Move that small tab along its rail to disengage the stop rod and you can lower the wheelhead so that the micrometer adjustment rides on the master. As the master rotates, the adjustment screw raises and lowers the wheelhead to the lift profile machined into the master. The grinding wheel replicates this motion at one-quarter size onto the camshaft. Grind and measure until the base circle is the correct size and then move the wheelhead to the next lobe and rotate the master to its correct angle for that lobe. By the way, a spray-mist system is used to cool and lubricate the workpiece which is 4130 chrome-moly steel.

Dwight Giles explained the heat-treat process which precedes grinding. He chucks the camshaft in the drill press chuck with a deep pan of water below. He heats several adjacent lobes with a torch while the shaft is slowly rotating. When the temperature of the lobes is above the transition temperature he quenches them in water while the shaft is rotating. This minimizes temperature differentials within the shaft that could cause warping. He does not heat-treat the entire shaft at once, and the ends are left soft. Dwight leaves the cam as hardened with no tempering.

Ken Hurst designed a mechanical analog computer to assist in calculating the angle of rotation of each lobe. Here he is holding Dwight Giles improved version which will do the calculations for an inline or a 90 degree V-8 engine. At the bottom is the crankshaft index (gear): around it are 4 buttons: each button indicates the location of a crankshaft journal as it rotates to the top dead center. Above the crank index and geared to it at a 2 to 1 ratio is the camshaft index with a timing wheel graduated in degrees. There are three buttons with it, one at top and one at 45 degrees to each



side of the top. The top button is for inline engines and the other two are for V-8's. These pieces represent in schematic form the geometry of the engine. The cylinder numbers are written on a piece of paper which is placed by the button representing the bank in which the cylinder is located. The crank index is rotated to the button representing Top Dead Center for each cylinder in the firing order and the corresponding angle of the cam lobe is read on the degree wheel angle at that button. Ken uses the center of the exhaust lobe for #1 cylinder as zero degrees: all other angles are referenced to that. The angles determined by the calculator will then be the center of the exhaust lobes of each cylinder in the firing order. The intake lobes follow their respective exhaust lobes by the lobe split angle: that is, by the angle of rotation of the camshaft by which the center of the intake lobe follows the center of the exhaust lobe.