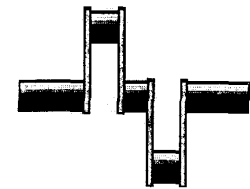


The Crank Calls



August 2003

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NEXT MEETING
August 16, 2003, 10 AM At
Robert Schutz's Shop
366 40th St. Oakland, CA

BAEM Web Site
www.baemclub.com

NOTICE!!!!
AUGUST SWAP
MEET
Bring your items for
sale or trade.

July 19, 2003
BAEM
Bob Kradjian, secretary

We had a good turnout for July with over fifty persons attending.

Visitors were Mike Nelson, Vic Vickers, Joe Nelson, and Rob Robinson.

A new member is Ray Smith of Lawrenceville, Georgia. He found Ken on the Internet and has joined our group. Welcome to all.

Treasurer Lew Throop reports we have a balance of \$1300 in the club treasury.

Again, thanks to all who participated in the Palo Alto Concours (pictures at the end of last month's newsletter).

Thanks also to Karl van Dyk who donated a ream of paper for our newsletter. And while we're at it, why not thank Bill Nickels for doing a splendid job as newsletter editor?

THE CLUB SAYS THANKS TO ROBERT!

The highlight of the meeting was the presentation of a spanking new Silver Eagle hit and miss engine to our host, Robert Schutz. The engine



was made, in secret, by members who made an assigned portion of the engine. The parts were then assembled and the engine proofed. It's a sweet looking engine that runs great. Credit will be given later if the modest members agree.

This gift is a token of our gratitude to our host. We greatly appreciate what you do for the club, Robert!

UPCOMING EVENTS:

This is the busy show season. Here is how the schedule is shaping up.

August 16---just after the meeting, Dick Pretel and Pat O'Connor will participate in a charity car show in the San Mateo area. Talk to them if

you would like to join in.

August 18---a few of us will show up at the annual post Pebble Beach Open House at the Blackhawk Automobile Museum.

August 22-23-24 is the big one. The Good-Guy's West Coast Nationals at the Fairgrounds in Pleasanton. See me if you wish to participate.

September 26-27-28 is PRIME (Eugene, Oregon). Don't miss this one, it may be the last! Unless someone picks up this show, the current buzz is that it will die out. Details are available at www.evmes.org.

The scheduled club meeting on 20 September is not a show in the usual sense, but I want to alert you to bring all engines available. Ken has arranged for a TV crew to appear to document our meetings. More about this later.

October 18 is the third Saturday of the month and our usual meeting day. Unless there is a serious revolt, we plan to have that meeting at the gorgeous Blackhawk Automobile Museum, just as we did last November. This is an excellent opportunity to show our stuff to an entirely new audience as well as to visit one of the truly great auto museums in the world.

The last scheduled show of the year will be the brand-new "Men, Metal, and Machines" (October 25-26) at Visalia. For those planning to attend, there is a \$79 rate at the Radisson Hotel (559-636-1111). For all the details, see www.cabinfeverexpo.com.

Finally-----Remember the swap meet in a couple of days at our August meeting.

Badges: Mike Rehmus continues to help us with his nice club badges. See him if you don't have one. I have the badges for Joe Landau and Hugh Walker. See me at the meeting to receive them.

BITS AND PIECES:

Mike Rehmus brought us a new supply of large outer ball-bearing races to use in "trammig" milling machine heads. The larger ones can actually fit around the vise if you wish to set up without removing said vise. This is easy way to tram to within a thousandth or so. Thanks, Mike.



Dick Pretel brought in the nifty little (15 cc) Seal Minor built years ago by our own Ed De Gear, and freshly refurbished by Dick. Dick found that the major problem was a poorly designed (by Edgar

Westbury) distributor cam. It had only a few degrees of dwell. The dwell is now at 32 degrees, and it made the engine run like a champ! Congratulations to Ed on a long and distinguished career in model engineering. He was making V-drives for boats when I was in college!



Ken Hurst had his 30 cc Wall Single.

I showed three German-made cut-a-way models. These were a rear end with axles, differential, and spider-gears; a clutch with fingers, re-

Photos by Bill Nickels



lease bearings, and discs; and finally --- a Wankel engine. These gems were found on e-bay, and are a

favorite at our engine shows. People LOVE animated displays that they can fiddle with, and play professor for their wife or kids.

I also brought in my venerable Challenger, which had just been fitted with a new intake manifold and two of Paul Knapp's Walbro carburetors with small venturis. It also has a 12-volt fuel pump. I couldn't get decent carburetion despite following Knapp's advice. Ken Hurst was kind enough to take the engine home and work on it. He was joined by Dwight Giles in working out problems in the carburetion tank, and engine base. The latest report is that it runs great. Thanks Ken and Dwight! One of advantages of belonging to this great group is the generous support of expert members.



John Vlavianos showed us the progress in the five main-bearing V-8 block. This block is replacing the Challenger three main block that just can't stand up to the pressure from overhead valves and a Root's type blower.

This new block will feature a starter motor mount, bell-housing, new water pump, and a distributor relocated to the rear of the engine. John estimates that he has invested over



500 hours in this project. Ken Hurst is machining the current castings to proof them. He says the pan matched beautifully to the block.

When this casting set reaches commercial stage, a builder can

combine the set with piston and rod assemblies from Dave McMillan, crankshaft and camshaft from Roger Slocum and have a great start on fabulous V-8. The general dimensions (bore, stroke, etc.) are the same as the Challenger.



John gave us an explanation of the process used in developing castings. It's not easy. John also has plans for a forged crankshaft blank and rods at a later time. Congratulations to both John and Ken for this ambitious project. Ken also ran his latest V-8. It's a screamer!



George Gravatt just keeps bringing out beautiful engines that run flawlessly. It must

be something in the Napa water. This one is a Bottle engine that had the bore increased from 3/4 to 7/8 inch for better performance. Several of our members have altered existing designs and achieved far better performance. These include alterations on the Panther Pup by Dwight Giles, and changes on a Bob Shores horizontal

single by Rudy Pretti. Changes on the ancient Wall four by Dick Pretel and Pat O'Connor are so extensive that you can hardly recognize the original design.

Al Vassallo displayed a 30-degree cam for an oscillating engine of his own design. As will all of his projects, there is remarkable originality and ingenuity. It is good to see him at the meetings despite a recent health problem. And speaking of health---it wasn't my idea to discuss health issues at the meeting, but it seemed to have wide support. I'll attempt to make it brief and helpful.

John Palmer brought an intriguing item. This was an antique meat grinder with a thumbscrew that was cast in place. How did they accomplish this? John learned that they coated the pattern with a light layer of clay over the captive threads that they later broke away. He says it's the "ship in the bottle idea."



Jim Piazza is developing a CNC controlled foam cutter for RC aircraft wings. But hold the phone! You could also use it to quickly develop foam patterns for "lost foam" casting. These would not have to be in one piece but could be glued together in complex forms that do not require draft angles.

Dick Pretel voiced concern that the club website needs an overhaul. Jim Piazza recognized the need for a club website. He initiated www.baemclub.com. Jim has become too busy to maintain and update the site. A new member, Mike Keeney, has kindly offered to become the new webmaster. The transition will be taking place over the upcoming months. Jim has posted nearly all the newsletters (at the urging of Steve Jasik) starting when he took the job of newsletter editor. There are 32 in all, dating from November 2000 to July 2003. Only August 2002 is missing. Jim will continue to assist with the newsletter and website as needed. Thanks, Jim, for dedicated and long service.

A major TV network has filmed a segment in Ken Hurst's shop and plans to appear at our September meeting to film our activities---if all proceeds according to plan. More details from Ken as they become available.

Newsletter editor, Bill Nickels, has asked for detail of the small, inexpensive balancer shown at



the July meeting. For those who were not in attendance, it is a small plastic stand that holds two powerful magnets. The article to be balanced is placed on a 1/8th inch shaft between sliding, tapered centers. Only one sharpened end of the shaft contacts one of the magnets. The other end is suspended, almost magically, in the air a 1/16 of an inch from the other magnet! The makers claim that

this product has 1/8 th the friction of a wheel-type balancer. The weight limit is 5.5 ounces. The maximum diameter is 12 inches. For small parts, it's just the ticket. (One could easily build a much bigger one in our home shops.) The device is marketed by Top Flite for less than \$20.00. It is available in hobby shops or at www.top-flite.com.

See you at the meeting. Remember the Swap Meet.

WANTED

1. Three jaw chuck, 1/2 X 20 with backplate.
2. Zero taper drill chuck

Contact Dick Pretel, 408-732-6507
Email: rpm10k@sonic.net

TECH TOPICS

BY PAT O'CONNOR

This month our own Dr. Bob Kradjian will talk to us about tuning up the human engine. The talk will be especially aimed at those of us with in excess of 518,400 hours on our pumps and transmissions.

July Tech Topic – Getting the Hole in the Right Place. Reported by Carl Wilson

Pat O'Connor led a group discussion on the techniques we use to "put the holes in." We know the size of the hole and that it goes there, how do we select the tools to make the hole and how do we make the hole in the right place? First is the layout, marking the location on the workpiece. Several of the professional machinists in our group have told me that they use layouts even when they are going to do a precision job using edge finders and digital readouts in the milling machine. Quite simply, layouts reduce mistakes. And many of the methods discussed below require layouts. A couple of notes before starting: first, I will refer to specific tools by their most common name. There will not be space to describe the tools and detail their use, so please refer to tool catalogs and machining texts for their description and use. Second, most of these methods are for what I call medium precision. Low precision is marking with pencil on the workpiece or on a piece of masking tape, center punching that location, and attacking it with a drill. High precision is using an edge finder in the milling machine spindle to pickup an edge of the work and offsetting the table the required distance to the center line of the hole to be drilled using the lead screw dial or a dimensional readout device. Making a layout and then aligning that mark with the spindle of the tool is medium precision. This tech topic did not discuss the layout procedure: we assumed that had been done. The other assumption is that the tool is a hand drill, drill press or vertical mill.

There is a technique that is "no precision," that is, it doesn't work. Try it sometime: take a piece of scrap steel, make some kind of layout, but nothing more. Chuck a 1/4" or 3/8" drill in a electric drill and try to drill exactly at the layout location. The drill will go everywhere but where you want it to go. The dead center (web) of a standard drill is rather blunt and the drill is flexible, so it wanders all around. Something must be done to encourage the drill to start in the desired location.

The three most common methods are:

1. Make a conical divot in the surface of the work that will center the drill as it starts to cut
2. Use a stiff starting drill such as a center or spotting drill
3. Use a drill that is ground to minimize wander such as a 135 degree split point drill

I. Center punch

A. No center punch - go to II.A below

B. Yes: How to locate punch in the intersection of the marks

1. A sharp prick punch will "snap" as it falls into scribed lines. Place the punch in one line and drag it along until it snaps into the cross line. Tap with a small hammer, check the mark: any error can be corrected by tilting the punch away from the direction which punch mark has to move and tap it again.
2. A sharp punch can be spun in the fingers to enlarge the layout mark after locating the punch as above. A special punch can be made by twisting 1/4" square section tool steel and grinding a prick punch. Place the point in the layout mark, and slide your fingers down the twisted shank of the punch to rotate it.
3. Use an optical center punch
4. A center punch may be used especially if the hole is to be hand drilled
5. A magnifying glass aids inspection of the location of the punch mark

II. Locate the layout line or center punch under spindle of machine tool

A. No center punch

1. Quick and dirty: chuck a small center drill and align its point to the layout by eye. Then drill a very small spot - any error will be obvious - move the work and check again.
2. Center the point of a wiggler or center finder (sharp end of an edge finder) - eyeball that to the layout location; even better use a magnifying glass.
3. Use a centering microscope.

B. Center punch

1. Chuck a small center drill and locate the work by eye. With the spindle stopped, bring the center drill down into the punch mark. Note which way the spindle and drill deflect. Move the work until the drill does not deflect. Rotate the spindle 90 degrees and repeat. Check both orientations several times. A sharp pointed rod can also be used.
2. Chuck a center finder. With the spindle not running bring the point into the punch mark. It will center in the mark. Misalignment with the spindle can be seen and felt. One recommendation is to feel the offset between the body and tip of the tool with a fingernail and move the work into alignment. A wiggler can be used in a similar manner (visually only, of course.)

III. Drill the starting hole with either a center drill, with a small drill (center punch only), or use a 135 degree split point drill.

IV. Drill the hole to size

- A. Run the finish size drill into the center drilled hole - OK for small holes and holes with large size tolerance
- B. Drill in steps (maybe 1/4" increments) to the finish size - useful with tools of low horsepower and for less rigid setups
- C. Drill a hole equal in diameter to the width of the dead center in the finish size hole and follow with that drill. A variation if this is to drill a semi-finish hole about 1/64" smaller than the finish size and then drill full size.
- D. To control chatter: drill through a shop rag or through the back side of a piece of shop roll
- E. Most brass alloys require the use of special drills. Standard drills tend to grab the work and will occasionally seize or break. To prevent this, the drill is deliberately dulled by grinding a small flat on both cutting edges. Keep these drills in a separate drill index.
- F. Do not allow the flutes of the drill to fill with chips. Peck drill: regularly retract the spindle, remove the chips from the hole and apply cutting fluid. If the chips are continuous, break them by briefly halting the feeding motion.

V. Cutting fluids

- A. Aluminum: charcoal lighter fluid, kerosene, kero plus cutting oil, WD-40, Type F ATF, ZEP Big Orange cleaning compound
- B. Steel: larded sulfurized cutting oil, proprietary cutting fluids such as TapMagic
- C. Copper: Johnson's Floor Wax
- D. Plastic: cold cream
- E. Stainless: larded sulfurized cutting oil, STP plus cutting oil

VI. Sheet metal: Standard drills do not work well in sheet metal. They tend to make triangular holes and then grab the workpiece as they exit the hole.

- A. Place the sheet metal on a piece of wood and drill them together
- B. Use a brad point drill or a unibit
- C. Use a hole saw for the larger size holes. Use the correct spindle speed, clamp the workpiece, and preferably use a hand drill motor. Most hole saws do not run true and do not work well in a drill press or mill.

VII. Safety: CLAMP IT DOWN! Use the correct spindle speed, sharp tools, and cutting fluid.