

The Crank Calls

Sept 2008

President	Don Jones	(510) 812-7006
Secretary	Carl Wilson	(650) 967-7715
Treasurer	Ken Hurst	(707) 257-2481
Events	Ken Hurst	(707) 257-2481
Tech Topics	Paul Bennett	(510) 247-3106
Editor	Steve Jasik	(650) 322-1386
Printer	Larry Zurbrick	(408) 448-5752

dj712@sbcglobal.net
 talleyho123@yahoo.com
 icengine@comcast.net
 icengine@comcast.net
 paulbennett01@comcast.net
 steve@jasik.com
 Lz_m57@pacbell.net

NEXT MEETING
 Sept 20, 2008 at
 Chabot College, building 1400
 25555 Hesperian Blvd, Hayward 94545
 Doors open at 9 AM
 Meeting Starts at 10 AM

Upcoming Events
 Celebration of Robert Schultz's life at the old
 Meeting place 366- 40th St & Broadway
 On Sept 13th, 2 – 5 PM

MEETING NOTES

8-18-08

Carl Wilson

Guests: Joe Thompson signed the guest register as a new member, and John Gilmore, builder of street rods, says that he wants to build a model engine. Welcome to Bay Area Engine Modelers.

Treasurer, Ken Hurst, reported that we have 77 members and an account balance of \$5168.40.

The estate of Robert Schutz donated what would have been his Red Devil engine to BAEM. The engine was sold at the WEME show for \$3000. Ken Hurst proposed that the club grant lifetime membership to the builders of the engine, Dwight Giles and George Gravatt in acknowledgement of the value the club received from their work. It was moved, seconded, and passed by the membership. Thanks, George and Dwight.

WEME: Carolyn O'Connor gave a provisional accounting of the show: final report will be available after the remaining bills have been paid. Mike Rehmus talked about getting notice of the show into the local newspapers. The reporters and editors are interested in "human interest" stories, such as Carmin Adams saying, "I do this to live." We think about engines, other people think about interesting lives and education.

Tom Hare has resigned as printer of the newsletter and Larry Zurbrick has volunteered to replace him. Mike continued this discussion by noting that the newsletter is the glue that holds BAEM together, especially for those members who are not able to attend meetings. Once again, if you are able to receive the newsletter online, please do so. That will reduce the cost and effort of printing and mailing.

Model Engine Builder magazine, aka Mike Rehmus, needs more internal combustion engine build articles.

Lay your micrometer aside and pick up the pen and paper! Mike also pointed to a new Yahoo group devoted to the magazine:

<http://groups.yahoo.com:80/group/ReadersofMEB/?yguid=199360847>



Tom Armstrong continues his build of the Snow pumping engine. The prototype, located in Florida, for this model is a 400 hp, 2-cylinder tandem double-acting gas engine that in its working days pumped well or natural gas for pipeline service. It was direct coupled to a two-stage compressor and ran at 90 – 100 rpm. The two cylinders are separate blocks bolted to a common foundation plate. Tom's problem has been aligning the blocks. The piston rod is supported at each end of the cylinder – that's four rod bushings and seals plus the pistons and rings. A small misalignment greatly increases the friction load.

George Gravatt brought the last of the Red Devil engines. He made some modifications that enable it to run slower; about 380 rpm is the lowest it will go. It starts with one quick pull on the flywheel. Nice job, George.

Bob Kradjian and Dick Pretel worked on Bob's Seal (Edgar Westbury design, 4 cyl, 15cc) and Seal Major (Seal enlarged to 30cc). Bob wrote this description of the problem and its cure: "Dick and I worked on the distributor and thought we had everything perfect. The current went to the moveable point through the spring. After a few short runs the ignition would go away. Replacing the coil and condenser was no help. We finally

noticed that the spring had become weak and appeared blue, as if very hot. By making a new insulated terminal and routing a flexible wire from the moveable point bar to the new terminal, both the Seal and Seal Major ran flawlessly through probably a hundred runs each. Take home advice: either power the fixed point, or use a flexible wire to connect the metal carrier for the moveable point to the insulated terminal. Do not pass the current through the spring. If the points are closed with current on, a heat build-up may create problems. Paul Bennet helped brainstorm this whole issue.”



Peter Lawrence is making slow progress with his 1” bore model Merlin engine. This photo shows the cylinder blocks bolted to the crankcase. Notice the neat profile of the cylinders: this all done one detail at a time on a rotary table, hence the slow progress. This 12-cylinder engine will have 24 spark plugs and 48 valves. Peter said that the cylinder head is going to be crowded!

TECH TIP:

Do not use plastic gas tanks unless the material is recommended for that usage. [Note that Naphtha (found in Coleman Camping fuel & Ronson Lighter fluid) is compatible with most plastics. For more info, see Wikipedia pages on Solvents and Naphtha]

TECH TOPICS:

Paul Bennet thought he might have a problem finding someone to present the Tech Topic so soon after WEME, so he decided to talk about one detail of his rework of the Wall 4 (50cc 4 cyl.) Paul has built several: he says that when he comes home from work tired, working in the

shop is good therapy. And it gives him something to think about – in this case an idea for a modular redesign of the venerable four cylinder flat-head that could be built as anything from a single cylinder to a six or eight cylinder in-line and from a valve-in-block to quad cam. Quite an ambitious undertaking.

The particular detail of this project is the connecting rod. Paul said that his thoughts on con rods began with Jim Piazza’s recent showing of the rods from his Upshur vertical engine. As Paul worked on the design of the modular engine he realized that the length of the connecting rod was determined by various other factors in the engine.

Let’s try to make a picture with words of the cross-section of a flat-head engine block. At top center is the piston in its cylinder with the connecting rod reaching down to its journal on the crankshaft. The upward sweep of the crankshaft just clears the bottom of the cylinder. Add to this picture a circle representing the maximum sweep of the connecting rod – all of the material of the crankcase must be outside this circle. A flat-head engine has all of its valve gear inside the block: that is the valve, spring, tappet, and camshaft lie within the block and of course, outside the maximum sweep of the connecting rod. This assemblage requires some vertical space so valve-in-block engines tend to have long connecting rods and therefore low con-rod angularity. If the valve gear is placed in the head that space can be reduced: the con rod and the block can be shorter.

But that is not the entire story. If the con rod is shortened, with the crankshaft stroke remaining the same, the result is greater con rod angularity. Increased angularity causes more piston side thrust and friction, and reduces the force applied to the crankshaft. There is a trade-off between long and short rod engines. Paul said that studying the interconnections between the various parameters gave him an increased appreciation of the work done by the early design engineers. They figured all of this out a century ago.

Paul showed his design for the rod. The engineering problem is to apportion the material to best withstand the forces imposed on the rod, mostly tension and compression. Fortunately for modelers, the forces are reduced by the square of the scale factor. Paul CNC machines his rods four at a time on a tooling plate. He leaves the crank bores undersized and fits them individually to the journal.

John Palmer mentioned the practice of deliberately offsetting the cylinder bores from the centerline of the crank (desaxe). This increases the turning force applied to the crank during the combustion stroke by reducing the horizontal component of the vector.



Lew Throop & Dick Pretel at a engine show in Palo Alto



Don Jones shows off his supercharged V8 to some visitors at Good Guys in Pleasanton



Jay Leno watches Dr Bob at the Monterey Historics



George Gravatt shows his Red Devil to a visitor



Race car driver Stirling Moss chats with Dr Bob



Ken Hurst attracts a crowd

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vambal968@gmail.com	Corey Renner
vystrcil@ev1.net	Karel vystrcil