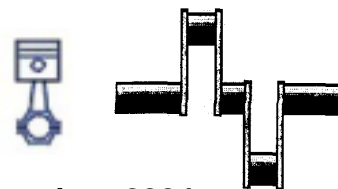


The Crank Calls



December 2004

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 Tech Topics....Pat O'Connor.....(408) 733-3710.....pat1650@yahoo.com

NEXT MEETING

POT LUCK HOLIDAY PARTY

December 11, 2004 – 11AM At
 Robert Schutz's Shop
 366 40th St. Oakland, CA
 Bring your favorite engine
 and food dish

Check out the BAEM Web Site at
www.baemclub.com
 Send your project photos to the
 Web Master Jim Piazza.
 Phone: 408-446-4825
 Email: jpiazza@ix.netcom.com

DUES ARE DUE

TO JOIN THIS CLUB OR RENEW YOUR MEMBERSHIP

Contact Lewis Throop at
 27272 Byrne Park Ln.
 Los Altos Hills
 94022-4324
 650-941-8223
lthroop@aol.com

MAKE CHECK
 PAYABLE
 TO LEWIS THROOP

Meeting Notes

November 20, 2004
 Bob Kradjian, Secretary

President Ken Hurst was in Missouri enjoying a visit with his wife's relatives. Carl Wilson was kind enough to step up and chair the meeting. He called the meeting to order at 10:08. There were 53 fine Americans in attendance. Our thanks to Carl for a terrific job.

Our guests were Bill Peterson and his grandson Chandler Baelgman, Joyce Sagl from Phoenix, and Jerry Twy who met us in Visalia.

Treasurer's report: Lew Throop says that we are holding steady at around \$1600. Our paid-up members list hovers near 110.

Activities coordinator Dick Pretel thanked all for their contributions as our season came to an end. As you know, the Blackhawk trip was cancelled by Jon Hart of the museum staff. He was concerned that we would be rained out. He is suggesting a mid-year, 2005 rescheduling combining with the "Danville Dukes." The Dukes are a first-rate street rod club and they will doubtless bring some supremely beautiful rods to the meeting. Don't miss it. Dick also described a visit to the famed Liberty Ship, the *Jeremiah O'Brien*. This is the last of the famed Liberties and it is still a working vessel with a total of seven voy-

ages to the French coast. A mere \$5.00 gets you aboard and the engine room houses an immaculate, and very old steam power plant. Some of our members thought it to be a Taylor dating to the very late 1800's. A miniature of the steam engine is on display and the whole megilla is at the Hyde Street Pier. Two hundred dollars will gain you an actual, short voyage on the O'Brien says Scott Overstreet.

I am told that the December *Road and Track* has a mention of our club (possibly on page 130 or 131).

Mike Rehmus brought us up to date on the progress of the Model Engine Builder Magazine. The mock-up looks terrific and he has lined up builders Bob Roach and Ron Chernich in Australia and Bruce Satra in Utah, Randall Cox (BAEM Member), John Vietti (BAEM Member), and Eugene Corl (Centerfold article & BAEM Member) for early contributions. Don't fail to support this worthy enterprise and tell your friends too.

Details at: www.modelenginebuilder.com
 Phone: 1-866-996-8999 toll free in the U.S. & Canada.
 Phone: (01) 707-642-5381 elsewhere. The premier issue is planned for March of 2005. For a more direct contact, call the toll-free number to subscribe or subscribe via the new Web site. If it's immortality that you seek, contact Mike for a build article on your favorite engine. If it meets muster, you're in print.

An extensive discussion of the Visalia show followed.

Our very large group was pictured, only in part, in the past newsletter. Congratulations to the Schoenlys for another fine event. It was great to get together with our So. Cal. Members; Butzen and Haagensen. Also, our friend, Lou Chenot took his fabulous Duesenberg project down to Los Angeles where he displayed it to Jay Leno's great approval.

Bits and Pieces:

Oscar Ortiz bought a number of beautifully handcrafted tools made by a neighbor. Measuring devices, fixtures, and tools were shown.



C o r
d i s -
o n e

Langewis
played his
and a half

inch bore Stuart vertical steamer. It has a reversing gear, a muffler, and an oiler.



Robert Schutz's nice Up-



shur engine was shown. Again, our thanks to Robert for his hospitality.

a simple hardness tester. This is a shop calibrated tube and a ball bearing (3/16" diameter). The 10-inch tube serves as a simple dropping guide. It can be tested against metals of known Rockwell hardnesses. This simple devise is known as a Schleroscope.

Dwight Giles, ever the ingenious one, devised



Bob Shores left us his *Little Devil* design in his last days. George Gravatt and Dwight are building a pair of them. One will be air-cooled and the other cooled with water.

George showed us a fixture for fly-cutting the deep trough for the big end of the connecting rod and the journal throw.

A question was raised concerning the status of Cole's Power Models. The gentleman who purchased the company from the Cole family in Ventura moved it to North Hollywood. Despite health problems concerning the new owner, a web posting of five months ago claims that all is well with the business at: www.colespowermodels.com.

Metal Supermarkets is a Canadian franchise with 17 outlets. A member said that he heard of the opening of a new Redwood City outlet. If anyone locates this store, please give the group details of the location and your "consumer report".

Remember that our annual Christmas meeting is a week early and an hour late. Make it December 11 at eleven for a great time. We will enjoy simply foods, socializing, and engines. Wishing you all a great Holiday season.



TECH TOPIC AT THE DECEMBER MEET BY PAT O'CONNOR

No December Tech Talk Due to Pot Luck Holiday Party

TECH TOPICS: Intake and Exhaust

11-20-04

Carl Wilson

Pat O'Connor talked about 3 of the many methods of getting the air/fuel mixture into and the exhaust gases out of the cylinder, that is, the intake and exhaust portion of the 4-stroke cycle. The gases do not flow continuously through the engine, that happens only in the turbine engines. Piston engines use valves or ports of various designs to control induction and exhaust. Pat talked about poppet, rotary, and sleeve valves.

The most widely used is the poppet valve, used in virtually all automotive, many diesels, and small engines. They are generally installed in the cylinder head (overhead valves, OHV), or in the block (flatheads, L-Head) or in both the head and block, (F-Head). As many as 5 valves (3 intake and 2 exhaust) per cylinder have been used. The valves for the Mery and some other early gas engines were placed in separate chambers that were bolted to the side of the cylinder. Many, if not most, of the early engines had atmospheric

(vacuum) operated intake valves and cam operated exhaust valves.

The Hicks marine engine did not have a throttle plate in the carburetor to control the engine speed. Instead the rocker arms were mounted on eccentrics which, when rotated, changed the valve lash and thereby the travel (lift) of the valve. Less lift allowed less air/fuel mixture into the cylinder and the engine ran slower.

The head of a poppet valve forms part of the combustion chamber. The head of the intake valve is cooled by the passage of the fuel/gas mixture, but the hot gases passing over them heat the exhaust valves. They are cooled primarily by conduction of heat from the head of the valve to its seat and to the valve guide. If they are insufficiently cooled, they may become hot enough to ignite the air/fuel mixture: pre-ignition; or the edge of the valve may erode and leak causing low compression. Some World War I aircraft engines used multiple exhaust valves to improve their cooling. Two small valves with the same flow area as one large valve will have more surface area in the valve seats and thus run cooler.

Poppet valves with hollow heads and stems filled with sodium have been used to conduct heat from the head of the valve to the stem and then into the valve guide. Recent internal combustion engine design has used multiple intake and exhaust valves to primarily to improve their flow characteristics (volumetric efficiency) and for the higher speed operation possible with lighter valves.

Rotary valves are very different. Let's build a mental picture in lieu of a drawing. Start with a piston in a cylinder and then cap the cylinder with a pipe tee with the side branch screwed onto the cylinder. Now put a close nipple into each of the straight through hubs, and then screw a ball valve or plug cock (gas valve) into each close nipple. The valves are both rotary types. They have a port or passage through them that when rotated alternately opens and closes to allow or prohibit gas flow. If the handles of the valves are connected to the crankshaft by timing belt, chain, or gears, the valves could function as intake or exhaust valves. Another variant uses one valve with ports for both intake and exhaust.

This system has not been very successful. It is difficult to seal and lubricate a rotary valve. The space in the port between the cylinder and the valve limits the attainable compression ratio, and the rotary valve has slow opening and closing characteristics and thus low volumetric efficiency. Rotary valves are different from the disc valves used for crankcase induction in 2 cycle engines.

SIC #30 contains a build article for the Aspin Rotary Valve Engine. This design places a cone in the combustion chamber attached to a shaft extending through the top of the chamber. The cone/valve is driven at 1/2 crank speed. There is one hole in the side of the cone, which aligns with the intake port, the spark plug, and the exhaust port as it rotates. This design allows for a compression ratio of 10:1. For those interested in this type of engine see the book "Rotary Valve Engines" by Marcus C. Inman Hunter, John Wiley and Sons, Inc, 1948.

R. C. Cross worked on rotary valves for 15 years but his engines were never used in a production vehicle. Scott Overstreet has an Owen Light Plant, a single cylinder engine coupled to a generator, and Merritt Zimmerman built a 250cc motorcycle engine.

Say "sleeve valves" and most of us respond with "Willys-Knight," an American car that used this system. Charles Knight designed the first mono-sleeve valve sys-

tem in 1905 and the double sleeve system in 1908. Burt and McCollum, of Canada, patented the mono-sleeve aircraft engine (date unknown). Sir Roy Fedden at Bristol perfected the design and had a research cylinder running in 1922. Mass produced high power aero engines were not available until the Second World War.

Let's do another word picture. Again, start with a piston and cylinder, but between the piston and the cylinder liner place a sleeve with a running clearance fit to both the cylinder and piston. Put some ports into the sleeve and cylinder, and some gears and linkage to both rotate and reciprocate the sleeve. For the cylinder head place a piston with rings, inverted head inward, into the outer end of the sleeve. Fix this head to the cylinder block and install 1 or 2 spark plugs in this so called "junk head". This system is complex and is difficult to seal and lubricate, but it has significant advantages for high-powered aircraft engines: there is no hot exhaust valve to cause pre-ignition, the ports can be designed for efficient gas flow, and the spark plug can be placed in the center of the cylinder head. Bristol, Napier, and Rolls Royce were the main manufacturers of sleeve valve aero engines.

For detailed pictures of Barry Hares model of an Eagle 24 cylinder sleeve valve engine go to engine.history.org and search for "sleeve valve". It is one fantastic model – you won't be disappointed.

Thanks to Pat O'Connor and Scott Overstreet for their additions and suggestions to this Tech Topic. Scott observed that the 4-stroke (Otto cycle) engine has not changed greatly since its invention. Poppet valves operated by cams and pistons in cylinders turning crankshafts were present in the beginning. A lot of engineering was expended trying to design improvements to this basic design, but it is being mass-produced to this day. The most significant improvements have been in tighter machining tolerances, and in electronic engine (fuel) control.

TECH TIPS

November 20, 2004

Carl Wilson

Trav-a-dials: The manufacturer of Trav-a-dials, Southwestern Industries, does not repair Trav-a-dials, nor do they sell repair parts. They do sell maintenance parts such as way wipers and crystals through local distributors. The distributor in the San Francisco Bay Area is Dimensional Control Corp, 650-591-0365. Any company that offers to repair Trav-a-dials is using parts from other units. One vendor for repair is: Brian Bear, North Texas Precision Instruments, 817-589-0011. Only the all black, rectangular bodied Trav-a-dials are repairable. You can make and install the way

wipers yourself. More information at the January meeting.

Scouring powder such as Bon Ami is a useful fine lapping compound. It has been used for seating piston rings in cylinders. Pour a little in the cylinder and start the engine. Don't ask if I recommend this procedure, I only report what I hear at the meetings.

Metal Supermarkets has opened a new store on Spring Street in Redwood City.
Call their San Leandro office for details: 510-259-1005

Upcoming 2004 Club Events

By Dick Pretel,
Events Coordinator

West Coast Engine Exhibitions For 2005

3rd Annual Men, Metal, & Machines! Visalia Conventions Center. Visalia, CA
October 22 & 23, 2005. Phone: 1-800-789-5068.
Web Site: www.cabinfeverexpo.com/MMM

East Coast Engine Exhibitions For 2005

Cabin Fever Expo in York, PA. York Fairgrounds Expo Center
January 15th & 16th, 2005. Auction January 14th 2005
Web Site: www.cabinfeverexpo.com/CFE

FOR SALE

Grizzly G1005 Mill-Drill \$650
Contact Jim Piazza 408-446-4825
Email: jpiazza@ix.netcom.com

FOR SALE

Lathe for Sale. Rockford 1930's 14" lathe. 6' between centers. Heavily tooled including 8" 6-jaw chuck, quick-change toolholder, taper attachment, 4-jaw chuck, 3-jaw chuck, and backing plates. It is old and worn but still capable of good work. 2-speed backgear. Overhead motor conversion from flat-belt drive. Overhead motor has 4-speed gearbox and is 220 Volt, single phase. \$1,500 for everything. Can be transported in a sturdy 1/2 ton pickup.

Mike Rehmus

mrehmus@byvideo.com

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**Model Engine Builder Magazine
is a publication of
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