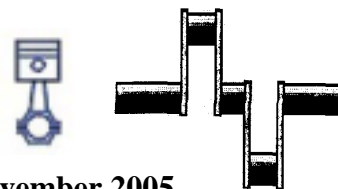


The Crank Calls



November 2005

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DUES ARE DUE

TO JOIN THIS CLUB OR RENEW YOUR MEMBERSHIP

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

MAKE YOUR \$25.00 CHECK
PAYABLE TO LEWIS THROOP

NEXT MEETING

**November 19, 2005 At
Robert Schutz's Shop, 366 40th St. Oakland, CA
Doors open at 9AM
Meeting starts at 10 AM**

**POT LUCK HOLIDAY PARTY
December 10, 2005 11 AM at
Robert Schutz's Shop, 366 40th St. Oakland, CA
Bring your favorite engine and food dish.**

Meeting Notes

October 15, 2005

Bob Kradjian, Secretary

President Ken Hurst called the meeting to order at 10:02 am.

Our visitors were Phil Fitting, Harry Genovsky, Larry Johnson and Scott Hoffman. Welcome, please return.

There were no "first pops".

Treasurers Report:

Lew Throop tells us that we have about a thousand dollars and are holding even.

Ken thanked Carl Wilson for chairing last month's meeting while Ken and George Gravatt put on a two-man engine show for a California Department of Consumer's Affairs group.

Special events:

Dick Pretel urged us to support the final 2005 show, Men, Metal and Machines at Visalia. We did!
See report below on the show.

GEARS Show: Members Dario Mecchi and Tom Armstrong both gave positive reports on the Portland show of last month. They praised the organization and hospitality of the sponsoring group. The Armory is close to the airport and hotel facilities. The Perpetual Trophy was awarded to a very fine Fairbanks-Morse engine, though both members felt that Jim Moyer's tiny V-8 deserved the honor. It will come, it will come! The only drawback concerning the show is the crowding; perhaps a bigger site for the future will be a possibility.

The Mazda Corporation in Irvine, California invited Ken Hurst, for a second time, to show engines. He was not only given a cordial reception but was given an entire, new, 2005 twin rotor, Mazda engine (full-sized) before leaving! Now that's a new standard for hospitality.

Ken describes a dynamometer set-up to test visiting car horsepower. The champ for the weekend was a twin rotor engine running 56 pounds of boost at 14,000 rpm. The reading? 975 horsepower!

Visalia: Men Metal, and Machines

The third Visalia meeting was a success from our standpoint, but possibly not from the standpoint of the organizer. Our BAEM members and friends had a great time; but the overall attendance was poor, and quite a few of the

vendors have bailed out. Gary strongly indicated that there would not be a fourth Visalia show. Stay tuned to see if he and his associates will be able to come up with another venue. He asked for, and received, several dozen opinions on what would be a good spot for another show. Without our club's participation, the exhibitor group it would have been very thin. My unofficial, but conservative, estimate is that we comprised more than half of the exhibitors. I won't list all the attendees; it seemed to me that we had as many as last year (over 35).

Bits and Pieces:

George Gravatt showed and ran his 1/3 scale 1917 Novo Hit and Miss model. It has 1 1/4" bore and 1 1/2" stroke, developing 1/8th horsepower at 525 rpm. The casting set is from Pacific Machine



Design in Bend Oregon. George was unable to coax their governor design into life and so he designed his own governor, which works beautifully. The phone number for Pacific Design is (503) 382-5926. The approximate price of the set is \$300. I was unable to locate a web site for this company.

Of interest, George also has the full sized Novo, bore and stroke both five inches. The estimated weight is more than 800 pounds. These engines were produced by the Novo Engine Company between 1912 and the late 1920's in Lansing, Michigan.

Shannon Lile is also building a 1/3 scale Novo. It is nearly finished and looks fresh in a nice green. Shannon is trying to complete the engine for the Visalia show using the original governor. Both builders describe the castings as excellent, but the drawings have a few minor inaccuracies and omissions.



Joe Tochtrop continues his productive line of casting sets and plans. Most of us have seen his Economy, as well as others built by club members Adams and Pretti. The latest Tochtrop offering is an original two-cylinder overhead camshaft engine. The bore is 1 1/8" and the stroke 1". It uses a 180-degree crankshaft with produces uneven firing. "Fire, fire, miss, miss" says Joe, adding that it

sounds like a 2 cylinder tractor engine. The project was started in 1995 with the final production of six casting sets. There are 28 castings in the engine/ carburetor, and 5 castings in the radiator. While the short block assembly is similar to existing two-cycle engines; the head, valves, camshaft, and the ingenious rocker arm arrangement, is all Joe's work. The casting set and plans are available from Joe for \$325.00.



I showed a rare Gary Conley engine, that being a V-4. Gary essentially chopped his original V-8 in half. He planned to build 200, but quit at 160. Mine is numbered 23. It is a glow plug engine with all



the problems that go with that type of ignition. His original valve lifters were quite narrow and had cut a groove into the camshaft lobes. I was able to regrind the lobes and use a longer and wider lifter. His enterprise is still afloat in Glen Ellyn, Illinois (see under conleyprecision.com). He formerly sold a kit for the V-8 that used discs for the crankshaft and ball bearings for the connecting rod big (ends as per the Schillings engines).

Pat O'Connor showed his versatility when the scheduled Tech Topic presenter failed to show. His impromptu talk on the common Briggs and Stratton engine was excellent. See Carl Wilson's report on page 5. At a future meeting I will bring a Briggs cut-a-way.

Give some thought to a new slate of club officers for 2006. The election will be held in January.

Visalia: Men Metal, and Machines



Visalia: Men Metal, and Machines



TECH TOPICS

10-15-05

Carl Wilson

Pat O'Connor: Briggs and Stratton Engine

Pat had a derelict Briggs and Stratton engine and on its way to the metal bin it passed through Pat's workshop and emerged in pieces. It was a mechanical autopsy. The organizing principle behind many of Pat's Tech Topics has been "Let's make an engine" and he figured that there was a lot to learn from one of the most successful engine builders in the world. So the pieces arrived at the October meeting of Bay Area Engine Modelers.

Pat began with a brief corporate history taken from the company website. Briggs and Stratton was formed in 1908 to make a variety of automotive products. One of the first was an ignition switch. They patented an "igniter" in 1910, but this appears to not be the igniter used by the hit-n-miss engines. Instead it was a combined automotive coil, timer, and distributor in one package. During WWI they made defense related products. In 1918 they were making engines for the US Navy. The first definite mention of small engines is a motor scooter engine in 1919 and a small overhead valve engine in 1920.

Two of their more interesting ventures were at this time. In 1919 they produced the "Frigerator." There is no more information but some of the details were found in the history of the Charter Manufacturing Company. Alfred Mellows founded Guardian Frigerator Company in 1915 and sold the company to William Durant in 1918. It was re-named Frigidaire, a name that we should all recognize. Mellows then started a refrigerator division for Briggs and Stratton. He later founded companies that became Charter.

The other venture was a bit more exciting. Briggs and Stratton purchased the rights to the Motor Wheel, a British design, from the A. O. Smith Company. This unusual motive power unit was a gas engine mounted alongside a wheel to form a unit that could be used to power a variety of contrivances. Briggs and Stratton used the Motor Wheel to power their Flyer cycle car. This was a crude device consisting of a wooden platform with bicycle wheels at the four corners, two seats, and a steering wheel. The Motor Wheel was mounted between and behind the two rear wheels, making the Flyer a 5-wheel motorcar. It was this fifth wheel that powered the car. Here are two websites with more information and photos:

<http://www.oldwoodies.com/gallery-cyclecars.htm>

<http://www.auto-motives.com/flyers.htm>

Today Briggs and Stratton claim to be the world's leading and largest builder of small engines and the world's largest manufacturer of racing engines. They make engines for go-carts and the next larger series of race cars.

Here are the results of Pat's examination of this engine: Continued on Page 6



Crankcase cover:

- Die-cast aluminum with 0.1" walls
- Crank and cam shafts run directly in bearings machined in the case material
- Stiffening webs direct oil into an oil hole leading into the bearing
- Oil seal on the crank has a space between it and the bearing to allow oil to escape into a drain hole.

Crankcase:

- Crank and cam run directly in the case material
- Splash lubrication with no oil feed directly to con rod big end
- Cam bearing has oil reservoir behind end of shaft
- Splash shield guards oil entry to valves so only oil vapor or mist enters
- Oil directed into separation side of timing gears
- Flat head: valves in block; intake port = 3/4"; exhaust port = 5/8"

Rod:

- Oil dipper fabricated from sheet metal is used as a lock for big end cap screws
- No visible oil entry holes

Cam:

- Cast together with blank for gear
- Cam is not ground – in fact appears rather rough
- Curved flanks – not hardened
- Large diameter follower
- Lift = 0.155" lift – see note below

Miscellaneous:

- Governor is a sheet metal vane moved by the cooling fan (part of the flywheel) airflow
- Points run on the crankshaft: spark every revolution (waste spark system)
- Magneto part of the flywheel
- Crankcase pressure relief built into the valve box cover

Note: A useful rule of thumb is that the lift of a valve does not need to exceed one fourth of the diameter of the port unless high performance is the goal. Pat measured the lift of the intake and exhaust lobes and divided them by their respective port diameter. The results were 21% for the intake and 25% for the exhaust. Fits pretty well with the rule of thumb.

Thanks, Pat, for this look inside a Briggs and Stratton engine.

TECH TOPIC for NOVEMBER MEETING

Our speaker this month will be Mr. Charles Evans of AMSOIL who will describe their synthetic oils and their applications.

Visalia: Men Metal, and Machines



Upcoming 2005 Events

By Dick Pretel,
Events Coordinator

West Coast Engine Exhibitions For 2005

TBD 2006

Club members can obtain a badge by contacting
Mike Rehmus at michael.rehmus@byvideo.com
707-643-6396 or at the club meeting.

FOR SALE

Craftsman metal lathe, 6"X12", model #109-20630 on heavy duty metal stand, 4-jaw chuck, 3-jaw chuck, new never used, tailstock live center, new never used, Jacobs chuck, new never used, Manual, thread cutting, provisions for cross feed and tailstock for wood turning, extra accessories, including motor and vibration free belt. This is the earlier Craftsman with the inverted V ways, not the flat-way lathe.
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