

## The Crank Calls



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### MEMBERSHIP \$25.00 US

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### **NEXT MEETING**

**August 19, 2017 at  
Golden Gate Live Steamers  
Tilden Park  
Berkeley, CA**

Doors open at 9:00 AM  
Meeting starts at 10:00 AM

### **Upcoming Events**

BAEM meetings: 3rd Saturday of the month

**WEME Show: August 25 - 27 at the Alameda  
County Fairgrounds, 4501 Pleasanton Avenue,  
Pleasanton, CA 94566**

### **MEETING PLACE FOR August 19th**

**We will meet this month (August) at the Golden Gate Live Steamers meeting room in Tilden Regional Park, Berkeley, CA.**

### **MEETING NOTES**

July 15, 2017

Bob Kradjian, Secretary

President Paul Denham called the meeting to order at 10:00 am at the Tech Shop meeting room in Redwood City. Please remember that the August meeting is at the Golden Gate Live Steamer's facility just one week before the WEME Show.

**VISITORS:** Alex Ziegel who has always been interested in miniature engines and has some machining experience, and Larry Brendlen. Larry is an engineer, and an accomplished RC flyer that is purchasing his first 3D printer.

**BIG WEME SHOW NEWS:** In July, Harry Daviess of the Goodguys welcomed us to the 2017 West Coast Nationals August 25 to 27. However, Steve Hazelton has just received news from the Goodguy's Office that the Fire Marshall has ruled that we are NOT allowed to run engines in our building! This is a huge development, and it seems that his department was alarmed by the Oakland

fires and made this decision. Another concern of his was the fume build-up in our exhibit hall. Engines may be run, but only outside of the building. They will provide tables. This comes after more than two decades of a flawless safety record. The Goodguys staff with Harry Daviess and Janae Jensen tried very hard to hold to the old arrangement, but without success.

**FIRST POPS:** Your secretary in conjunction with ignition wizard Paul Denham have finished the spark ignition conversion of the glow plug equipped Schillings engine seen at the last meeting. It now delivers a very hot spark from eight automotive coils to new Rim Fire plugs and it pops and pops. There were a LOT of pops, but no self-sustaining running. We are tracking down compression issues as well as the timing. Determining the firing order on a four-cam V8 engine is another adventure. Add to that, a flat crankshaft to make all the usual automotive advice shaky.

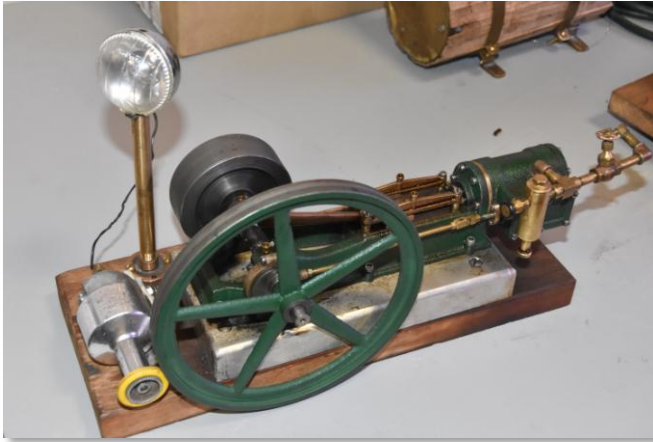
**TREASURER'S REPORT:** We're continuing to do well, all obligations settled.

**CLUB BADGES:** If you are a member in need a badge, contact Mike Rehmus (mrehmus@byvideo.com) who has offered to produce them.

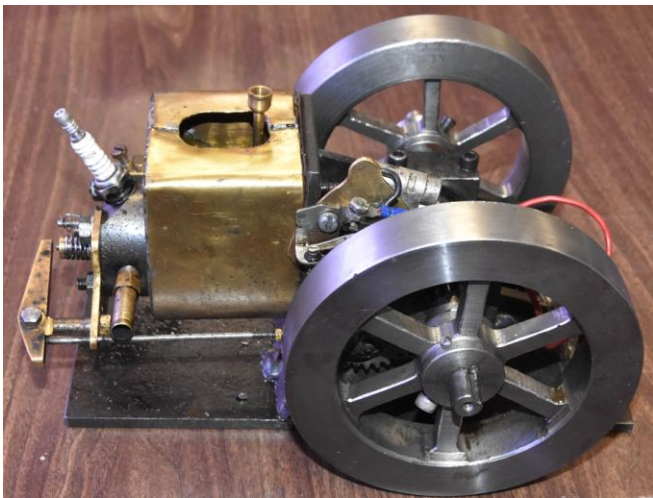
## **BITS AND PIECES**

Dwight Giles showed us a “What’s-it”. Members quickly identified it as a device to surface the piston ring ends.

Mike Rehms showed us a thirteen-dollar Sterling from Bang Good. It’s crude, but it runs.



Paul Diehn is a retired Caterpillar mechanic who met us at the GGLS site several months ago. He brought his PM research # 10 steam engine. He designed his own boiler using a Harbor Freight propane burner. It has a one and a half-inch stroke and a one-inch bore.



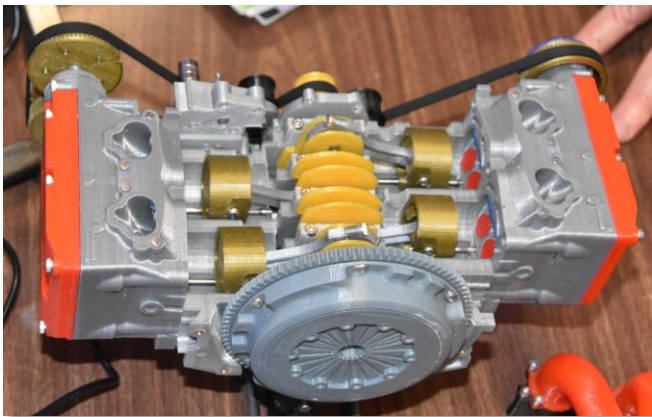
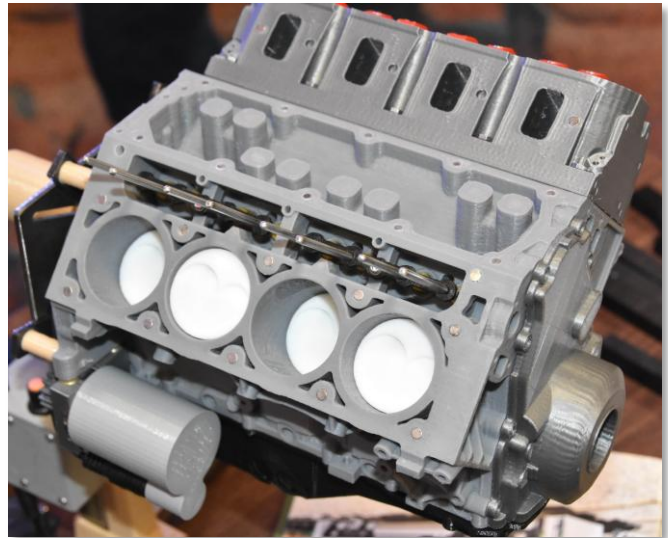
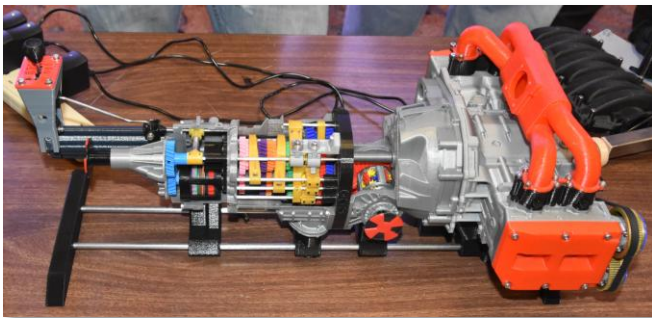
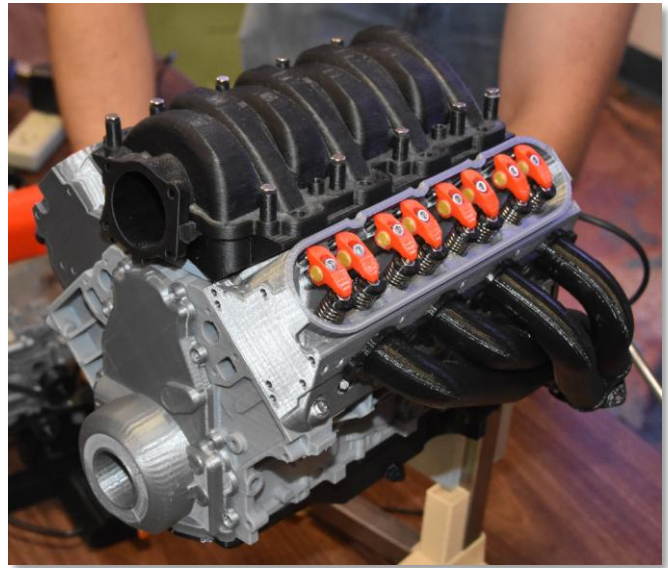
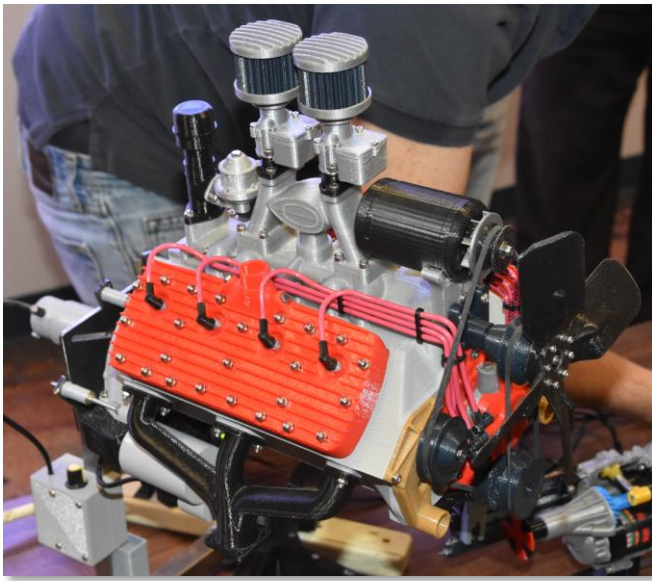
He also built a PM Research hit and miss engine from their plans using bar stock. Several members immediately volunteered to help him with compression and ignition problems.



Dwight Giles brought us up to date on his ambitious and unique Ford Model “A” project. He is using detailed plans for the full-scale engine. While taking a break from making the complicated patterns for the block, he took some time out to make a 4130 chrome-moly crankshaft. It is a complicated design if you make it the way Henry Ford did. Dwight not only finished the shaft, but also for good measure made the flywheel and the 108 tooth, 24-pitch ring gear. The end gear has a 1/16<sup>th</sup> inch broached keyway. The oil pump gear is also a bit tricky, but it’s now on to the connecting rods (2024 aluminum) before he wants to tackle the patterns again. Much later, he will work on the clutch. The clutch is oddly complicated for a 1920’s design, and actually requires a number of square holes. This led to a discussion of broaches and how to make them in the home workshop.

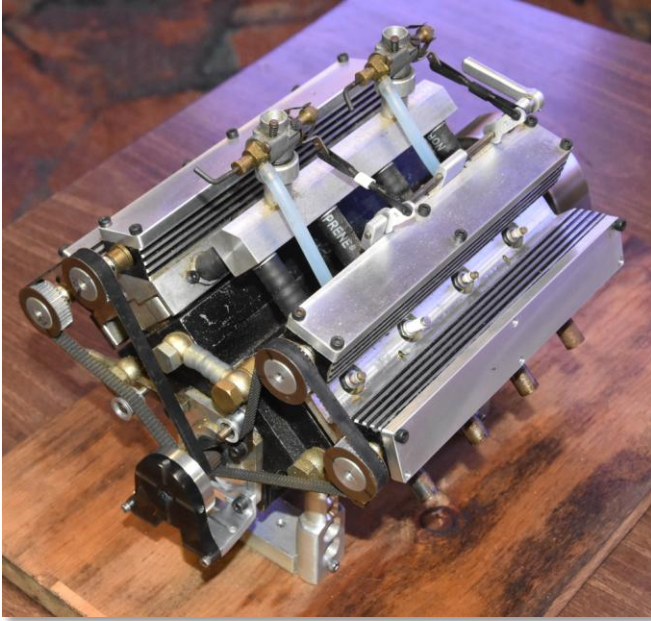


Eric Harrell is a mechanical engineer who showed us his ingenious and instructive one-third scale 3D printed flat-head V-8, and a 2002 Subaru flat four.

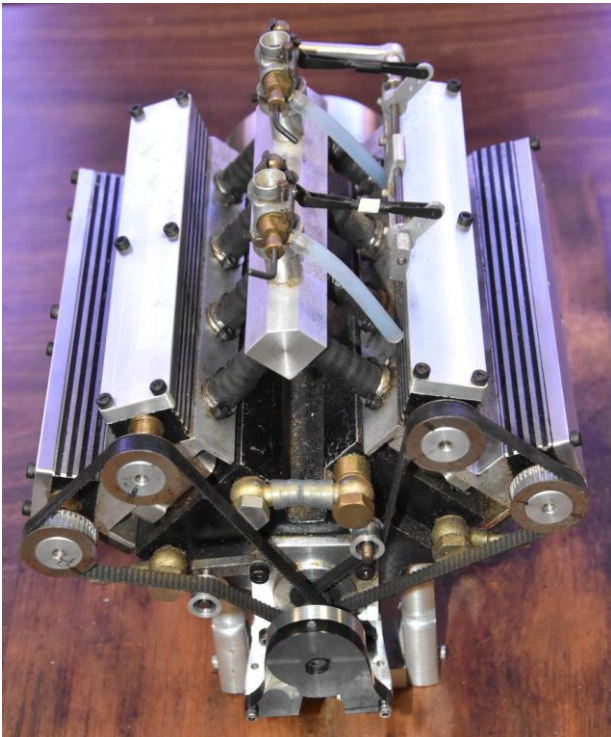


They are working, but not actually running, models animated by small DC motors equipped with speed controls. The engines are modeled in Solidworks and printed from a palette of 20 colors in PLA plastic. No painting required. All of his plans are available on line and are free on Thingiverse. Eric has agreed to display his fine engines, transmissions, differentials and other parts at WEME in August. His web site is: [3dprintedengines.com](http://3dprintedengines.com). Just type in his name on You Tube to see much more. He also has videos on You Tube with Engineering Explained. That site is recommended for lucid presentations on ignition systems and crankshaft design.

## TECH TOPIC:



Paul Denham presented the latest in an attempt to convert a glow plug Schillings V-8 to spark ignition. Initially, the use of a cam-driven distributor was considered, but rejected, as it would require re-machining two of the four camshafts. Paul said: "Why don't we go distributor-less?" Since many autos are now running that way, it was worth a try.



It was decided to drive a magnet wheel directly from the crankshaft. The sensors would be either Hall effect sensors, or reed switches. A single magnet was mounted in an aluminum disc. Paul then made up a Hall pickup ring with four sensors. He then created an ignition board with eight (yes, 8!) big, honking automotive coils. These came from China at



All of this uses the knowledge that our flat crankshaft fours and V8's all feature two pistons coming to top dead center simultaneously---one on compression, the other on exhaust. So, with a single magnet and four equally spaced sensors, you will be firing two spark plugs each 90 degrees. The exhaust spark will be "wasted" and of no significance. This amounts to just one magnet and four sensors, either Hall effect or reeds.

He obtained surface mount solid-state ignition driver boards from China.

A time-out feature comes into play when you leave the points closed. This is a David Sage design and featured in Issue #34 of "Model Engine Builder".

A final discussion centered on lubrication when not using glow plug fuel. For the crankshaft on the Schillings engine, an access and drain hole for three ounces of oil. The camshafts will eventually be fitted with oiled felts contacting the lobes. Two-cycle oil will be added to the gasoline for cylinder lubrication.