

From: Terry Burtz <model.a.engine@hotmail.com>

Date: Sat, Mar 28, 2020 at 9:29 PM

Subject: Mar 2020 New Model A Engine Update

26 March 2020

Updates

In case someone gets this Email without seeing the article on the new Model A engine, the article can be found at <http://www.modelaengine.com>. If anyone has a question, concern, comment, or suggestion, please let me know at model.a.engine@hotmail.com and I'll do my best to resolve the issue.

New Engine

This project started in 2007 and stalled in 2015 because of sky-rocketing cost and the lack of quality control at foundries in California. Previous updates, pictures, and videos can be found at www.modelaengine.com

FordBarn (<https://www.fordbarn.com/forum/showthread.php?t=265782>) is an internet social group for Model A Ford hobbyists, and there are a lot of interesting questions and comments regarding this project. I use the term "new engine" loosely because the only new parts are the cylinder block, crankshaft, and connecting rods. All interfaces for mating parts are identical to original and have been documented from original Ford drawings.

In the 2 July 2019 update, I was happy to state that the project was resurrected and I would be working with others (John, Leonard, and Bill) to have the "new engine" manufactured in China. A lot has happened since the last update on 25 Jan 2020.

Cylinder Block and Main Caps

CAM Logic Inc completed its work to digitally model the exterior of the cylinder block based on the laser scan.

John had planned to travel to China to present the CAM Logic Inc exterior model in mid-February but was unable to due to the Coronavirus outbreak. However, in the interim, John has been working with the factory in China remotely to move the project forward.

The data file from CAM Logic Inc was sent to China and is being used to make the exterior pattern. We also asked CAM Logic to confirm that all wall thicknesses were 5/32 inch or greater per Ford drawing A-6015, and they found that when the SolidWorks core models were combined with their exterior model, the wall at the front of the valve chamber was found to be thin. This was corrected by making the valve chamber core slightly smaller to add wall thickness, and this file was also sent to China.

The machined surfaces drawing made from my SolidWorks file is close to being acceptable. One more iteration is needed because their fore and aft tooling holes on the bottom of the cylinder block need to be moved inward.

Cylinder block foundry tooling is nearing completion. The factory in China has provided a schedule projecting completion on 18 April 2020. All tooling (core boxes, and the cope and drag patterns) is being CNC machined to the SolidWorks core and exterior models that have been provided by us. Everything that is external to the

cylinder block casting including sprues, core-prints, gates, runners, and vents were designed by the factory in China

The factory in China is in the business of making cylinder blocks in volume, so the tooling has been designed for use on their automated tooling line that can mass-produce cores and molds that are precise and consistent.

The 15 attached figures show what some of the tooling will look like. The first 2 figures show cope and drag patterns that are ready for automated molding, and the other figures show various stages of tooling completion. All tooling will be machined from aluminum.

It is my belief that the only "hands on" operations will be core setting, mold closure, and pouring. Once a good casting is poured, it needs to be verified through a series of comparisons, measurements, and tests including:

- Compare the casting exterior against an original cylinder block. Superimposing laser scans of the new and original cylinder blocks would be ideal.
- Compare roughness and texture of surfaces.
- Pressurize the water jacket with air while the cylinder block is submerged in water to check for porosity.
- Cut a casting apart into many pieces to verify all wall thickness and that there is no porosity.

We cannot dictate the process for verification, however, we can ask questions like: "How are you going to verify that the exterior is identical to original? How are you going to verify that there is no porosity?, and How are you going to verify wall thickness?"

John is in contact with the factories in China about 2 times every week, and I talk with or Email John every few days. Unfortunately, because of the Coronavirus, John will not be able to travel to China and witness the verification process.

The Coronavirus along with the engineers not using the laser scan has slightly slowed progress in China. If foundry tooling is complete by 18 April 2020 and they produce a good casting on the first try, it is possible that a machined casting may be available in May 2020 assuming that there

that a machined casting may be available in May 2020 assuming that there are no CNC errors.

Crankshaft and Connecting Rods

SolidWorks models of the crankshaft and connecting rods have been provided and the instructions to the factory in China are to follow the SolidWorks models. The machined crankshaft drawing with dimensions and tolerances looks good. Rolled fillets, balancing, hardening, bearing inserts, and the rear main seal was discussed in a previous update (26 Nov 2019).

The crankshaft factory asked and was granted permission to have the connecting rods forged from steel instead of cast from malleable iron. We agreed as long as there would not be any increase in price. Preliminary drawings of the connecting rod have been marked up and returned to China.

Next Update and Other Comments

There have been no changes that will have an effect on pricing. The pricing goal is to provide these parts at a price that is competitive with the cost of machine work for the rebuild of a stock Model A engine.

Before authorizing production, we have asked for 3 sets of hardware that we can inspect and evaluate by building running engines. Although John cannot fly to China to meet with his contacts at the factory, freight is still actively moving.

In preparation for the next update (end of April 2020?) we have asked for photographs that show the finished foundry tooling and the first casting.

Terry Burtz, Campbell, Calif.



















