Hudsonator – A Hudson Enthusiast shares his 308 engine build

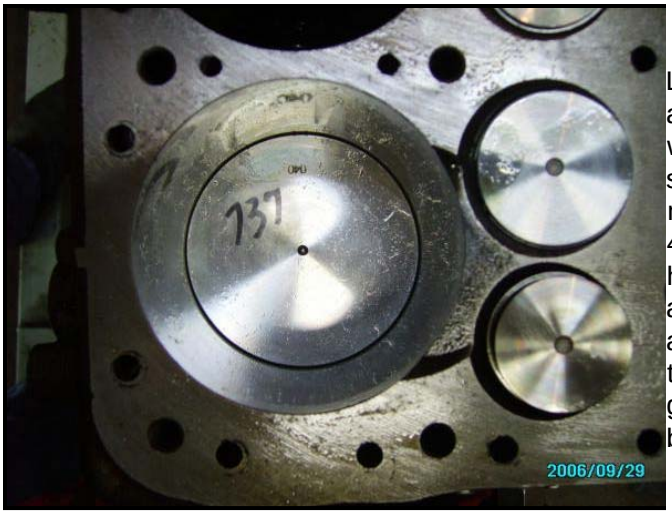
While getting Our '49 inspected for the summer season, I found mucho problemos in the valve train dept. In fact, the deeper I went - the more attention this old warrior needed. So, OUT came the engine to fix its ass before things got way out of hand.

So, my Dad and I tore through all the Hudson parts in the various hiding places about and hunted down the best parts in the best condition. Basic camshaft 390 lift @ 254 duration, crank went .010/.010", and the bores cleaned up nice at .040". Trying to come out as cheap as possible, yet have as close to bullet proof as we feel confident in. We had some more radical cams, but the stock H-145 camshaft showed no wear or deviation whatsoever - hard to argue with that.

Hard to believe that's the same block huh? The deck was cut .025", which was .002" too much. The pistons stand out of the block .002". I can live with that as the compressed thickness of the gasket we're gonna use is .045", still a dang good squish clearance with plenty of expansion to get into the .025-.030" zone. The resulting piston height has taken 5 cc's out of the combustion chamber volume without changing any flow characteristic whatsoever. The final compression on the engine will be 8:1.

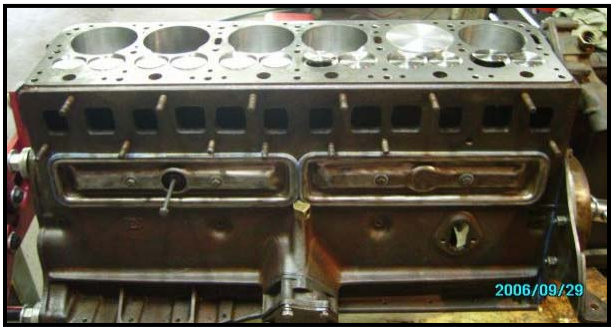
You can't possibly know your final, theoretical compression without knowing what your clearance volume is. Had we not zero decked the block, we'd be running about 7.2:1. Just the decking alone, brought that up to 8:1. with no decrease in the head's combustion volume where it counts or cutting its breathing one bit. If you are going to rebuild a flathead, you're missing a huge performance boost not to zero the block.

I practice what I preach, that indicator is sitting at +.0015" and you can plainly tell - that piston isn't down in the block at all. I'm tickled that it came out that close.



Looking down in the bore of #6. My Dad actually coerced the machinist we've worked with for so long – back out of semi-retirement to do this bit of machining. Looking down a hole with a 4.5" stroke makes things seem far away huh? The hone job is such that you can actually read the .040 in the cylinder above the piston. I love that! The 737 is the weight of the piston/rod assembly in grams. The rotating assembly was balanced by the same machinist.

What you can't tell about a Hudson just from looking at it from the top, is that the valves are canted toward the cylinder at 7.5 degrees. As they open, that actually open toward the cylinder, as opposed to most flatheads
that open parallel with the cylinder. Also, the valves are about as close to the cylinder as they can get and remain structurally sound. In fact the argument could be made that they are too close as the valve pockets are Siamese to the cylinder wall. If you valve seat cracks and is not taken care of, the crack will proceed into the cylinder - the point of no return.



This is the view that sets it apart from the crowd. Those huge intake ports, one for each valve. The stock Hudson intake valve diameters are 1.815" with the exhausts being 1.500". That's plenty of valve when you begin to look at the other flathead valve diameters and what they can be enlarged to. The venerable 7x, (which is the same valve setup as the stroker I'm building) has the 2.02" intake, 1.650" ex valves. God I hope we have this outfit running in time for the Redneck Rumble. We broke a ring in #5 as it hung on the damn valve relief cut! ARRRGGHHHHH! With any luck at all, the ring set for #5 will be in tomorrow and I can have some fully assembled and painted pics. yeeee hawwww!

The cost, not what I had imagined, but not exactly cheap either. This one is going to run at 315 CID here's how its breaking down..

Machine Bill = $689.00
Crank reground, Rods resized, exhaust valve seats machined and installed, valve guides installed, valve seat angles cut and lapped, block dipped and cleaned, cylinders bored .040 and finished hone. Rotating assembly balanced.

Parts = $1361.00
I had bought some parts prior to finding out the whole shebang needed overhauling, mainly valve train parts. We only bought what we needed after checking out things like valve springs, retainers, etc.. I also had some items like new Cam bushings I got in a parts deal, etc. We resurfaced our own lifters and did some remanufacturing work ourselves. We would have come out better buying the whole overhaul package from Dale Cooper @ $1365.00.

Other costs:
Hudson 4 barrel manifold = $350.00 You can actually buy these new from Clifford Performance. Mine is an extremely early Clifford that does not have Clifford cast into it. It has Hudson cast into it, Jack was bending the NHRA rules a tad. I don't have this much in my manifold, but I wouldn't sell it for $350 either. Stating the cost
of a brand new Clifford,

Edelbrock Performer Carb = $230.00 500 cfm performers are cheap, the 230.00 was including shipping and the rejetting kit (which I'd recommend as part of the purchase). I bought mine from JEGS, and just as soon as I had mine bought, they had remanufactured 500's for about $100! Keep your eyes open, those are dandy carbs.

Headers = $330.00 Also available from Clifford Performance. Pricey? Consider this orphan engine hasn't been manufactured in 50 years! I'm damn happy to find headers that are really quality pieces. A good set of sbc headers is almost as high, if not higher for some applications.

Total Cost = $2957.00

Like I said, its not as high as I expected - but its not cheap either. The machine bill, is low relative to the rest of the project. The machinist involved is the same one I used to do the cutting on my first "over the top" Allis engine back in 1985. He came out of semi-retirement to do this one just because he knows anything me or Dad does is never the ususal. For the record, he charged me $875.00 for the machine work on that Allis engine back in '85 - I've never forgot that.

Just to round out the engine and costs to build something like this, lets look at a "Rumpety Rumpety" camshaft option and a ready built electronic ignition recurved for your camshaft. 21st Century Hudson Performance Parts from folks who know!

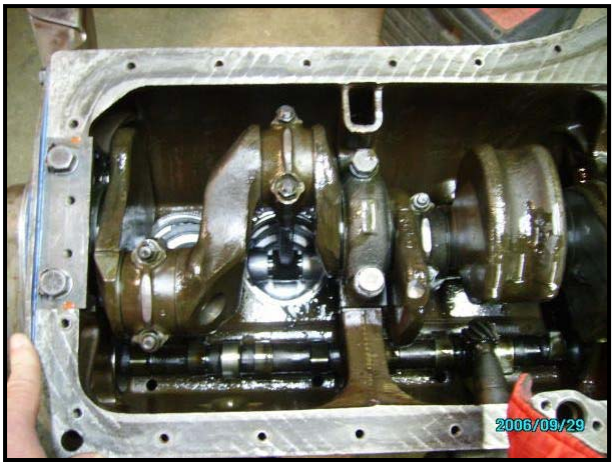
7x / 391" @ 268 Or a Hot Street .403" @ 278 (this is what my stroker cam spec'd out at) $165.00 + 50.00 core charge if you don't give up or don't have a Cam to exchange Electronic Ignition, Randy will and does take personal pains with these ***distributors*** and can hook you up according to your cam choice. ***May seem pricey at $220.00***, but probably a good idea if you are not savvy on recurving mechanical advance distributors.The total for a "crate" engine then, with blueprinted specs and all new components internaly.

Ready to fire and scare the masses with a bumpety rumpety Maas Camshaft.

EXTENDED COST $3392.00

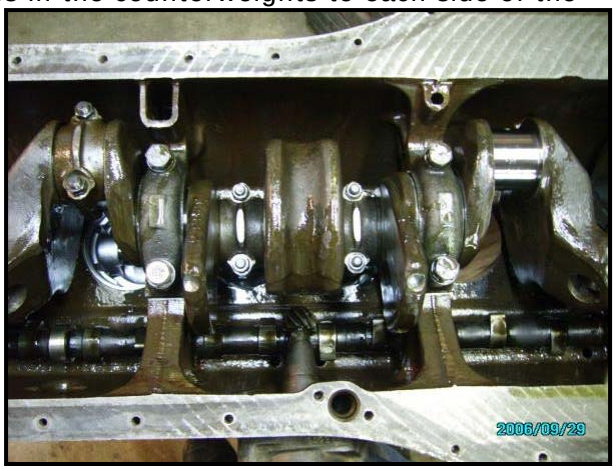
The stroker engine is coming in at 355 CID, 3.880" x 5.00" stroke. Triple 40 DCOE Webers for the breathing apparatus. 2.02 int / 1.650 ex. Randy Maas "Hot Street" camshaft (same as in the cost example). A couple of interesting tidbits to show up between these two engines: The stock crank in the 315 CID engine, 85 lbs. Rod and Piston assembly, w/ stock replacement cast pistons =737 grams. Stock crank in the 355 CID engine, 88.5 lbs. It was stroked, lightened, chromed, and balanced. It's now 82 lbs. Venolia custom forged pistons based off 283/307 Chevy pistons on stock rods fitted with 351W Ford ARP rod bolts = 575 grams. Other mods include the re-machining of the crank snout to fit SBC harmonic balancer. The 355 is very involved. This is where the argument of hopping up a vintage engine vs. the sbc gets valid in favor of the sbc. The 315 will probably run around 170-185 hp with around 375 ft/lbs torque at 3700 RPMS. For roughly $4000.00 The 355 will run in the 290-300 hp range with around 450 ft/lbs torque at 4250 RPMS. I haven't totaled up the cost of the 355, mainly because I don't want to cry openly and it's not even done yet! The reciprocating assembly alone cost $3700.00. The camshaft and valve train cost another $495.00, but that included some custom tappets, stainless 7x valves, and an original/in the box set of Iskenderian valve springs, retainers, & locks marketed originally in 1965. The Clifford/Weber manifold ran $330.00 and was the last one Clifford had (insert a huge sigh) and I had the 40 DCOE carbs on hand. E-bay value of the carbs, probably$300.00. I had the double roller timing chain from a parts deal; they cost $210.00 to replace. The bearings, Valve guides, and gaskets I bought from Dale Cooper = $950.00. I'm roughly estimating the remaining machine work, ARP studs/bolts/fasteners I need, and the carb parts I'm going to have to buy to tune the webers = $3000.00. That would be an estimated cost of $8950.00. Might as well say $9000.00 Moral of the story, you can build a 200hp Hudson fairly reasonable. To go higher up to 300 hp - it's going to cost you $50.00 per horse to do it.

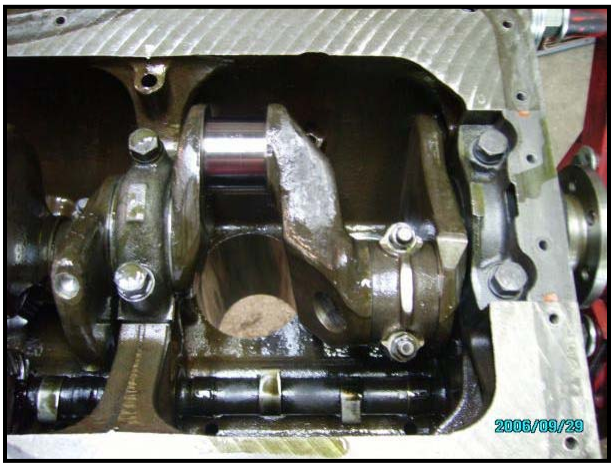
The guts of a Hudson 308



Here is some more of what you seldom get to see, the guts of the animal.

The crank weighs in at a portly 85 lbs. Each rod/piston assembly weighs in at 737 grams. Starting at the front Middle section, note the gargantuan counterweight swinging in the middle. The forged-in groove is to clear the oil pump/distributor shaft. On the stroker engine we had thought this to be part of the problem with crank breakage - turns out it isn't. I didn't tell Jimmy anything about what was done to the stroker crank, but if you notice in the crank pictures, you'll see some fresh drilled holes in the counterweights to each side of the huge one in the middle, adjacent to mains 2 & 3 - that's were a lot of the lightening took place on the stroker. Evidently this is the common point of imbalance with these cranks. Nobody takes the time to properly bob weight an inline six crank, thinking they are "naturally" balanced. They aren't, haven't seen one yet that is. Never let anyone convince you of that, physics says it is - but production pieces do not fit the physics formula.





The last cylinder pair, 5&6

Jimmy does a fine job on cranks. This one is to the limit of his ability as far as length and weight were concerned. That is one big, heavy, piece of forged steel. Tap it with a wrench and it will still be singing 5 minutes later. If we had the ring set for that empty hole, I'd feel a lot better.

This is what a Hudson rod and piston look like. Hudson rods are 8.125" long from center to center. The piston is a fairly honest reproduction of the originals, with the exception of not having pinned rings. Note the two oil rings. Does this mean I'll have twice the control over my oil? Its actually to help control piston rock and better keep the piston travelling parallel with the cylinder walls. Long stroked engines benefit by this quite a bit. The added friction is nowhere near the friction of another compression ring. I was surprised that these cast pistons weighed as much as they do, but they are long