Jan 10, 1968

Dear Charlie,

If the '54 Hornet engines were more prone to lose mains than the '51-53 models of that same engine I was not aware of it. I have heard of these engines throwing rods from being over rev'd when they were badly worn, particularly the early '54 with the flat noted camshaft which let the engine turn out more rpm's, but this was a case of neglect rather than design. Other than higher compression (7.5 as against 7.2 for aluminum heads and 7.0 as against 6.7 for cast iron heads) there was no design difference in the engine that could affect bearing life. As a matter of record almost all of the early '51-'53 engines that had originally been equipped with aluminum heads wound up their life span running aluminum heads that had been milled or ground to refit them or with 262 cast iron heads when the owners gave up on the aluminum heads. These engines ran many miles with heads that produced the equivalent or better compression ratios than the 7.5-7.0:1 for the '54's. So I do not feel reasonable additional increases in ratio would be a major factor

in shortening main bearing life.

If your engine had the two center main bearings fail I would definitely look for the cause before I had the engine rebuilt. Check the oil gallery feed passages in the block to these bearings and be sure they are open. It is rather unusual to have both center mains go unless the engine was run practically out of oil or the passages became blocked with sludge or some other foreign materials when the engine was run low on oil. If the car has 60,000 or more miles on it and had been run hard, this could have been the case if the previous owner didn't keep the engine reasonably full of good oil.

There is no point in having the bearings line bored as the bearing bores just about never become misaligned after the initial line boring at the time of manufacture unless the block has been damaged and welded. This was one of the reasons Hudson used aged blocks, to prevent any distortion after initial machining.

What do you mean by a 7X camshaft? I hope you have not purchased or planned on using the early '54 flat nosed camshaft which so many fellows have been lead to believe is a

7X camshaft. The so called 7X Cam. 309742 is the '54 early camshaft which requires a new timing chain about every 4 to 8 thousand miles. The real 7X camshaft is part No. 311040. The part numbers are embossed (cast in) the camshafts in the fuel pump lobe area of the rough base circle part of the camshafts. The '54 camshaft (309742) will give you about 10 horsepower additional, but the 311040 camshaft will produce about 18 additional horsepower and will not cause the timing chain to rattle.

As long as you are having the engine overhauled I suggest that while the block is out of the chassis and stripped down, you should have the head bolt holes drilled and tapped for ½ x 13 head bolts. (Use 27/64" dia drill) Have the holes drilled by a drill press or use a cylinder head to keep the drill straight if you use a hand drill. The cylinder head can be used as a drill fixture. (You will have to shift the head to drill the three center holes as they are smaller than all the rest). Also either use a drill press to start the ½ x 13 tap to be sure it is straight or again use the cylinder

head as a fixture. If you use a cylinder head you will find that the ½" tap will go thru all but the 3 center holes and as the tap fits snug the tapped holes will be really straight.

I suggest that you use a "262" or "232" cast iron head. If you use a "262" head it should be a '54 head, not a '51-'53 as the '51-'53 head will not give you enough worthwhile compression increase on a '54 block. You can use a '51-'53 "232" head OK. If you have the block head bolt holes converted to the ½" bolts which I strongly recommend, have all of the bolt holes in whatever cylinder head you use, drilled out to 9/16" diameter. Do not purchase ½" head bolts from an auto parts house as almost all of them sell only a grade 5 bolt (with three lines in the head) which cannot be pulled any tighter than the standard Hudson 7/16" dia head bolts which are grade 7-8 bolts (five lines in the head) - Try to find a '55-'56 Hudson in a junk yard and get the ½" dia grade 8 bolts from it. If you use the grade 7 or 8 ½" dia bolts you can pull them up to 115 ft lbs of torque

while the best you can get from the grade 5 bolts is about 90 ft lbs. which you can get from the grade 8 stock 7/16" bolts. It is possible, and I have often done it myself to run a high compression head on a Hornet block and use the standard 7/16" dia head bolts but it is safer to use the 1/2" dia bolts as was done on the '55-'56 Hornet 6 engines. Of course if you use the 1/2" dia head bolts you must use a '55-'56 head gasket which have the 1/2" bolt holes. If you use the 7/16" stock bolts be sure the threads in the block and on the bolts are clean. Oil the bolt threads and under the head of the bolts as you install them. Pull them down in the proper sequence up to, but not exceeding, 90-95 ft lbs. After the engine is thoroughly warmed up, retorque them again to 90-95 ft lbs. After 100-150 miles with the engine warm, again retighten them to the 90-95 ft lb torque by first loosening each bolt about 1/8 turn to free it in the thread area and then tighten. You should do the same with the grade (8) 1/2" bolts but use 110-115 ft lbs of torque.

The head gasket should be sprayed lightly on both sides with aluminum paint before it is installed.

Use a good grade of premium fuel and set the ignition to the second mark before the T.D.C. line on the flywheel. You will find the the old Hornet can really run and that you won't have any trouble keeping out of anyones way, in fact most of the standard vehicles will be kept real busy moving over to let you by.

When I drove East last summer to Harrisburg in my '52 Hornet Hollywood in which I have a great big fat "262" stock engine with a .060" milled "232" head stuck on top anything that didn't keep up a steady 80-85 mph. pace got passed. On several occasions in the wee hours of the morning my daughter who was following me in the (390 LTD) began frantically signalling with her headlights when the tail lights of the Hornet began moving away when her speedo indicated 95-100 mph.

If you have any additional questions I will be glad to try to answer them for you

I do hope your camshaft is the 311040 as this cam along with a high compression head ("262" or "232") can make a real car out of a standard Romat.

See you in St. Louis.

Sincerely,

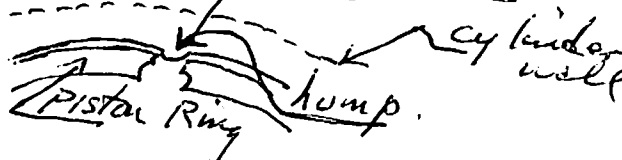
J. Bernard Hoffman

1/31/68

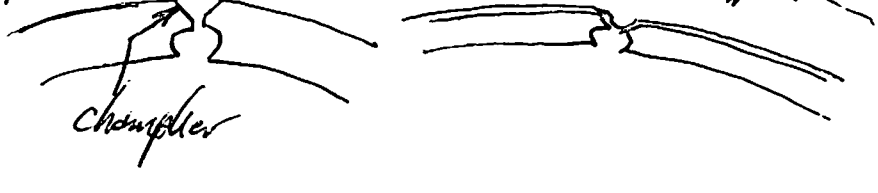
Dear Charles,

Regardless of what your former (Hudson??) service manager told you, genuine Hudson service pistons were of the pinned type. There were many other sources of pistons for Hudson engines which were not pinned. There is nothing wrong with using unpinned pistons provided the vertical ridge (or hump better expresses it) that wears in the cylinder walls at the upper pin position is honed out of the cylinder. If you are having your block rebored (I forgot whether or not you were) then there is no problem. If not, the walls should be honed just enough to clear out the ridge.

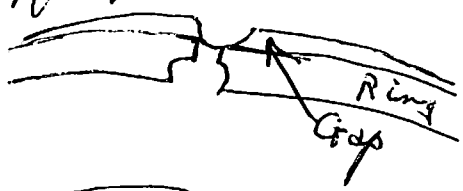
As the pinned rings wear, and as they remain in the same position in relation to the cylinder walls, a hump is left protruding into the cylinder wall like this.



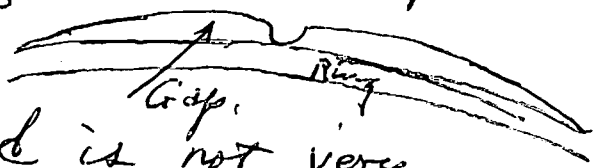
When reringing an engine even with pinned rings, either the hump must be honed out or the new rings champhered on the ends to clear the hump like this ---------- cylinder wall.



Otherwise the rings will stand off of the cylinder walls like this on pinned rings



and like this on unpinned rings



If the engine being reringed is not very badly worn the lands only extends downward into the cylinder about 3/8" and that can be turned out with a ridge reamer that extends its cutting tool face into the block 3/4" or more.

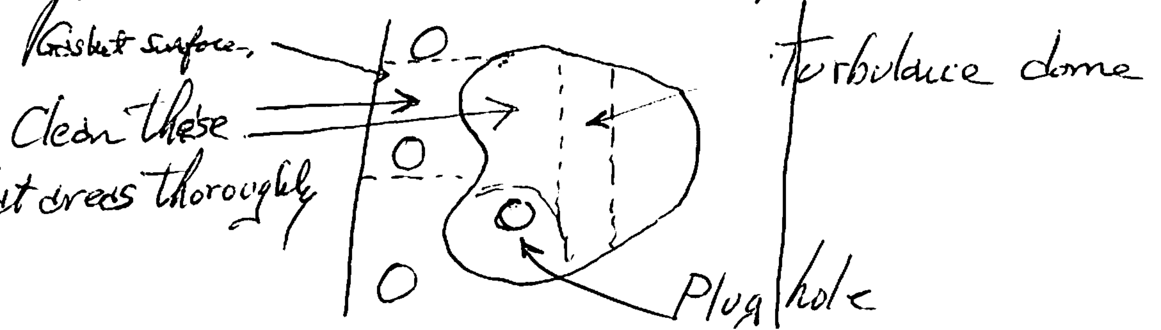
Your unpinned pistons are definitely OK and as a matter of fact might be better than the pinned type as in the high performance engines where higher pistons temperatures occur, the piston heads expanded to the point where the pin hole lost its firm grip and the pin worked out causing quite a clatter until either the engine digested it or it passed out through the exhaust valve.

While an aluminum cylinder head will produce slightly more power for the same compression ratio and/or permit the usage of a lower grade fuel for the same compression ratio as a cast iron head, they require more attention and gasket replacement than a cast iron one. In addition, the corrosion problem still hasn't been mastered. Overall, the advantages are with a cast iron head.

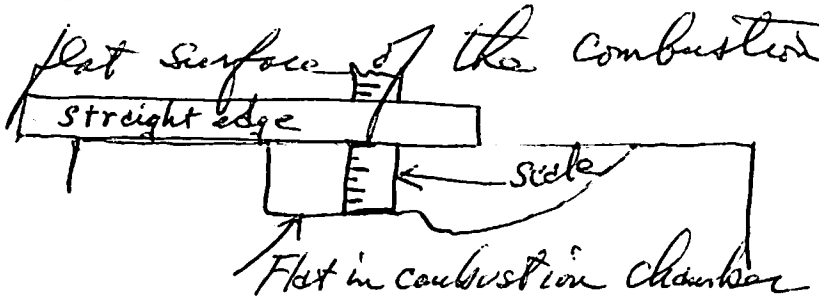
I believe the important thing about the cylinder head you use, regardless of year or type is how flat it is and how thick the bottom deck (gasket surface side) is. I am sorry I can't remember cylinder head years by number but there is normally a little of the original paint left on the head somewhere. Of course it is evident that the 52-53 Wasp or 51 Pacemaker heads can be identified by the "232" cast on top of the head in the area of the water outlet and the same for the Super 6 heads which had a "262" cast into them. If the heads had originally been painted red, they were '54 heads, silver was '51 and gold was '52-'53.

To determine which head to use I suggest you do the following;

Clean out the carbon from one of the combustion chambers in each of your "232" or "262" cylinder heads. It is only necessary (for the time being) to get to the bare metal on the flat section of the combustion chamber, like this.



Then lay a straight edge across the cleaned gasket surface as shown on the other side and measure down to the flat surface of the combustion chamber, like this.



You will find that previously unmilled heads will measure as follows.

"232" '51 Pacemaker 1/2-inches '51 "262" - 9/16"-inches

"232" '52-'53 Wasp 15/32"-inches '52-'53 "262" 17/32"-inches

"232" '54 Wasp 7/16"-inches '54 "262" 1/2"-inches

What you will need in a finished head is the 15/32" depth and as I strongly recommend a resurfaced head, if you have a good '52-'53 "232" head to start with it will require only a quick grind to assure its being flat. The second choice would be the {'51 - "232" / '54 - "262"} head which should be milled .030". The third choice would be the '52-'53 - "262" head which should be milled .060".

After you have a head milled or ground, be sure to use emery cloth all around the edges of each combustion chamber to smooth off the ragged feather edge left by the cutter or wheel as these edges will act as glow plugs when the engine

is run hard and can cause pre ignition or self ignition, detonation and other undesirable characteristics.

If you want still more zip you can use the "232" '54 Wasp head. This will require the best of available fuels and will cause the 6 volt starter to protest mightily when trying to start the engine hot. You may experience some hot starting difficulty with even the 15/32" depth head but with a good battery and a good starter solenoid I have never known one to fail to start.

If you have any further questions please do write again.

Sincerely,

Edward Leffel