

What you're seeing there is basic as what we showed today is if that changes .001 amount of an inch, its times the bob weight, you might have an 1800 gram bob weight. What we're seeing when you're changing the bob weight, even if we're measuring it absolutely exactly in between the two splits. It is just reading the change. It is reading the change of mass when it is going on the journal, most bob weights are made out of aluminum, the v's are cut very nice. When putting your bob weights on, to make it easier put them all to the center, all to the left or all to the right.

Following up what he was talking about bob weights, most manufacturers have manufactured two kinds, lead shot and stackable weights and one of the biggest comments we get about lead shot, because you're dealing with such small increments and you can be that much more precise, but what he was talking about is that you've got a cylinder wall and you got the lead shot in it and some of the common things that happens is repeatability balancing machines, people go immediately to the head, whether it's an analog or digital and they start there with their problem or often times they will go through and check these bob weights through the repeatability of spinning, those things will loosen up and as that lead shot falls to one side or the other, you just affected your mass. They need to be tight.

Q. We hear about the differences percentage wise in V8 and V6 balancing. Could you explain that?

A. The bob weight percentages are determined by the OEM manufacturer when they design the engine and the running mass. What comes into play is having to chart the percentages and then some of the pieces that effect the balance the job, and that would be motor mounts and the condition of them. The percentage on most automotive is 50%, the V6 is 45-46%. We are going to help AERA get with the manufacturers to make sure on stock engines with stock mounts that we get the proper percentage. The earlier engines is 40% reciprocating and 100% rotating and the balance shaft motor that we are going to see more of is just like a V8, 50% reciprocating, 100% rotating. I think it is vital for the shop that you have to ask the customer and make sure what engine you're dealing with. If anybody has looked at a new car, you have seen these engine mounts, and all V6's shake. They will always shake and it is very vital to use the stock mount with the stock engine and there is a lot of change going on. You have to make sure that on a V6 engine that you're customer is using the proper mount for the proper year.

A common term that we have used in tolerances of .5 and .2 we hear it all time, seems that a lot people always chase those standards, but when we are working the diesel or industrial, it seems to be a redundant problem. We see people trying to take a Detroit 671 or Mack and take it to 2/10ths ounce inch.

Q. Would you elaborate?

A. They are entertaining themselves if they take an engine that size down to .5 or .2 it goes back to the same formula and that's why it is so important to get used to using that, that engine is going to turn maybe 17, 18, 2,000 rpms in all and it has a much heavier crank than the automotive. The balance tolerance is a full 1 or 1 1/2 instead of .5 per plane, so total allowable 2 ounce inches.

I fooled around with moving the bob weights around back and forth on the journals and I've noticed a lot of change and if you don't have your bob weights dead center on the journals, you will get different readings.

Q. But you mentioned that if you put all your bob weights to front, back or center them up that is the most important. But on a V8 because it works on a couple. If you have all the bob weights to the front isn't that going to change the relationship between the bob weight and the counterweight that is counter balancing it because you're spacing them more to the front or back?

A. No, not at all. It is actually personal choice, you want to be consistent when putting them on. I think the important part is that they are all the same. Make a chart up of each engine and readings.

On that chart you can also record what the previous bob weights readings were and what made up the bob weight. Sometimes if you start to rotate the crankshaft and your numbers seem out of line, it is really good to have ready reference.

Q. I've been told that on high-performance application that you want to increase your reciprocating weight as the rpm goes up, is that true?

A. No, that is not really true. A regular V8 is going to be 50% reciprocating, 100% rotating. We haven't really talked about overbalance, but everyone knows about it and what they are doing basically instead of a regular V8, because we have 90 degree block, they are adding 1-3% to their reciprocating total.

I am going to finish on one little funny note, we talked a little this morning, everybody is worried about tolerances and doing a good job, I had a client call up and he said, "Gary, you've got to help me, I've been building this race engine, its a 4 wheel drive truck puller and it was a 468 cubic inch big block Chevrolet on alcohol with a huffer injected and he was on the national circuit. The crankshaft cost was 4,000 dollars and he said, Gary, my machine is wrong, checked my bobweight, I lost everything, I broke 4 cranks. So after studying everything, his totals were right, how's the machine, how's the tolerance, how hard is he turning the engine, 9,200, I said, this guy is crazy, what do you mean 9,200? The customer said it only has to last 30 seconds!

We appreciate being here. Thank you very much!