? Spec Piston and Exhaust ?

Posted by Karl @ ART - 20 Sep 2008 13:46

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With the update / backdate rule is it safe to assume that we will all have motors with the higher CR 88 pistons at some point?

Would it be less expensive to have a spec piston allowed along with what's currently allowed?

Note that I will have to take about 0.040 off my 83's head to get in the 10.2 to 10.5 range if I keep my stock pistons. I don't even know that I can remove that much without an interference issue.

Also note that a custom piston could be made at 100.1 mm which would allow for many blocks with ring grooves to be honed back to perfect without sleeving or coating.

The Nationals illustrated that the HP limit in the Cup rules is flawed. At least one motor was built over the HP limit but was then brought back down with a restrictive exhaust. That yielded a car with equal HP but greater torque compared to the rest. I really donâ□□t believe they tried to exploit the rules, they just built the best motor they could and then had to find ways to tune back the HP. Weâ□□ve all heard the HP is for show and the torque get the job done. There are topics on this forum about exhaust size. Wouldnâ□□t it be easier and ultimately cheaper (less dyno tuning) if we had a spec exhaust?

I know this is troubling to some of you, but as numbers grow so does the spending to get to or stay at the front. The more parts the directors of this series can spec the tighter the racing, the less complaining and the less we all spend.

Thoughts.

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Re:? Spec Piston and Exhaust ?

Posted by joepaluch - 21 Sep 2008 01:18

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For now we require stock pistons standard size pistons. So we do have "spec piston".

Those come in 2 flavors. 83-87 9.5:1 pistons and 88 10.2:1 pistons. Theory stays 10.2:1 are better, but

reality shows the cars are the same with either piston. Only 20% of 944 spec cars have these pistons and their performance is pretty even with low comp pistons. Shave the head only to achieve flatness. IN practice shaving to max compression results it no real gains with less chance to flaten later on if needed.

Now there are also 3 tolerance groups that are Porsche factor standard size. These stamped 0, 1, 2. These are not to be confused with oversize pistons, but are the way Porsche allowed for the proper pistons fitting in the bores. Both bore and piston will have a stamp with 0 and 1 being the most common.

As of now overisize pistons are not allowed. This is to prevent someone from undertaking the expensive process of boring the cylinders with the expensive Sunnen process and then obtaining expensive oversize pistons. In time if the supply of standard bore blocks dries up that may change, but I don't expect to see that for many years.

As for shaving you can shave to the allowable compression limit and not have contact with the valves.

One thing to remember is the 944 motor in general is insensitive to normal hp adders and builder tricks. A good built motor will be solid and reliable not a big hp motor. If you try to build a big hp you will be dissapointed when some backyard rebuild comes equal in hp.

As for the exhaust one good thing about a stock header is that requring that balance out the exhaust factor. The stock one is really quite good and most run with test pipe and either an aftermarket or stock muffler. Either one works fine and power curves do not change.

From power output level we are all very very even. However we are not close to the published "Cup" limits. Doing that would cost too much money. 944 spec does not have a hp limit, but we do limit the parts. Stock pistons, stock headers, stock chips, stock intake from AFM back, and stock fuel pressure all contribute to stock hp levels and more importantly a stock power curve. Really the only adjustments are the removal of the Cat and the ability to tune the AFM to ensure a decient A/F ratio curve. In practice an AFM can easly go out of tune and damage a motor when pushed hard so best to allow competitors to get the right mixtures again. This is in fact a rather crude adjustment and also impossible police since there is no clearly defined factory setting.

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Re:? Spec Piston and Exhaust ?

Posted by SvoChuck - 21 Sep 2008 02:29

Thank you SOOO much Joe for being the rules guy !

Karl here are a few data points about stock motors with stock chips (stock,stock,stock) .

The highest power car at nationals in 2007 had lower comp pistons. second had the 88 pistons.

A pro built motor at Gateway this year with 88 pistons made 4 more HP than my 83 motor that I got from a junkyard car (I changed the rod bearings) .

I think in a stock set up something is limiting the power being made other than the pistons . AFM ? Header ? I'm not sure.

As for a CUP car at Nationals making way over 150 HP based on my information of stock engines you would need to be CHEATING in a big way to make that kind of power.

Scott Bove had to work on his engine to get it up to the 145 level. I think a custom chip and header is the 145 number...

just my thoughts...

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Re:? Spec Piston and Exhaust ?

Posted by Sterling Doc - 21 Sep 2008 03:27

.... but as numbers grow so does the spending to get to or stay at the front...

Thoughts.

Karl, your statement above is very true, and it is critical to a spec series that this not be let get out of hand. Rules stability is also critical here. As we've found out quite painfully, rules changes often lead to a lot of turmoil. To that end, we will be entering the 3rd year of a 3 year rules freeze next year. Outside of safety issues, we will not be changing the rules for '09. However, in light of the nature of the business, as you've referenced above, it's also good to start to put some thought into the '10 rules.

So far "Pro-built" motors from DART, MantisSport, & VFC have not produced any "outlier" HP & torque levels - most in the 137-139 HP level, and around 141 ft.-lbs of torque. No ones been above those numbers on a Spec motor that I am aware of. Those have been both low & high compression piston cars, most with open exhausts, which seem to work well with our cars, though a good muffler doen't hurt much, and is much easier on the ears! My 1st car was an 1987 924S, with 40K miles since a pro rebuild, dyno'd in the above levels as well. So far, it's been remarkably difficult to extract more power from these cars, or to lose a great deal with a simple, solid rebuild either. That has been the reputation for 8V 944 motors for some time, at least w/o AFM/cam or other pretty radical changes.

Given this, we're inclined to be conservative with rule changes, but very interested in gathering some data over the next year as we head into the the window to adjust the rules for 2010, if needed. Your input and experience with SM is appreciated! Sorry I didn't get back with you at Nationals (it got pretty crazy near the end!) - would like to talk some more though - will call. It was good to see the SM's run a clean race this year!

One question, can the Nikasil lined block be "honed" to 100.1

w/o requiring removing & replacing the Nikasil (this is a very expensive process)?

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Re:? Spec Piston and Exhaust ?

Posted by joepaluch - 21 Sep 2008 21:28

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Sterling Doc wrote:

One question, can the Nikasil lined block be "honed" to 100.1

w/o requiring removing & replacing the Nikasil (this is a very expensive process)?

Our blocks are actually Alusil. Slightly different from the 911 blocks. The deal is this. If cut the bores on a normal machine you also cut away the silicon in the bores. The proper process cuts the metal and then

goes back and cuts the bores again to ensure the proper ratio of metal to slicon is at the surface. The bores themselves are not lined at all, but the slicon is simply a part of the material in the block and needs special machining process to "reveal it" at the surface. Sunnen refers to the special machine they bores are cut on.

The down side to all this is that it costs alot to machine the bores. The good news is that because of this the bores are very very long lasting and are often perfectly good after 100k + street miles.

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Re:? Spec Piston and Exhaust ?

Posted by Karl @ ART - 23 Sep 2008 09:32

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All,

Please understand that I just want you to look into the future with me. When I first started building motors for the SMs we were making up to 113HP at the wheels in the 1600s. We are now well over 120. The SM rules did change to allow us to build to the CR limit in the manual which was about 0.2 greater than if the motor was built to dimensional specs. How much of the gain came from the CR jump and how much has come from learning what tolerances the motor likes, I donâ□□t know.

I guess you guys need to decide what you want for this class. Big numbers are great because it means everyone gets someone to race against, but it also means you will get guys who will hire others to build their cars and support them. They will want the best and the more room you give them the more they will take. If someone dropped of a 944 with low CR pistons and asked us to build it with the high CR pistons it would cost him more for me to find a high CR short block, take it apart and clean it all, than it would if I just had to order a spec piston and build around that. Just food for thoughtâ□¦and you wonâ□□t convince them that 9.5 and 10.5 produce the same power.

Joe,

We have all the stones and pastes required to hone the 944 blocks. Our normal hone process is three steps, the process on the 944 is four IIRC.

Eric,

My understanding is as Joeâ□□s. The block is uniformly impregnated with silicone (or similar) crystals,

so honing out 0.1 mm will not take you out to soft metal. The key, and remember Iâ□□m still very new to this kind of block, is to get the crystals smoothed down so they donâ□□t tear up the piston skirts.

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