Rocket’s Motors ~ Thread Page 1

by **Kurt Bozarth** » Mon Aug 15, 2016 1:24 pm
Anyone care to share their NQ40 LS setups?

Kurt

by **rocket** » Mon Aug 15, 2016 9:14 pm
The higher timed guys, 7 under 11, 12, 13 over. The factory setup is 3 to 5 under 13 over. The lower timed guys nothing under 15, 16 over. The higher timed guys favor the 5 prop. Lower timed guys 6 and 7 prop. You wanna play with hotter plugs... 10 under 15 to 17 over. 5 prop. The difference in the no shim under setup and 6 thou under is 2 degrees in exhaust timing. You should measure the stroke. The norm is 188-9 tdc but some cranks have been measured with more.

moe4sho » Tue Aug 16, 2016 9:34 pm
Kurt, in Phoenix this year I ran two different engine setups: 190/.019 and 194/.024 not sure if this is a significant difference. Rocket would know. I used a 7.6 prop on both and the same tuning. I ran the same time with both. I only commented on this because I'm interested in how much engine setup matters. The fast guys always go fast. Is that engine setup or pilot?

Kurt Bozarth » Wed Aug 17, 2016 2:07 am
I'm not looking for that last little bit of speed out of a motor (we all know I need more than that!) but rather some starting points for two motors that I bought used that don't seem to run that well. Thanks.

Kurt

P.S. Thanks Rocket for all the numbers...I'm waiting for my wife to decipher them for me and then I might understand.

rocket » Wed Aug 17, 2016 6:00 am
What prop and ground rpm.
Does it surge, struggle on the ground.
No unload in the air.

The most common problem is bad fit. Poor breakin. The second is the liner. Not all liners are created equal. I would start by cleaning the piston up with some mothers polish. Then some 1500 in the liner. Roll the liner back and forth on the edge of the bench while moving the oiled up 1500 back and forth inside the liner. You want to see a fine cross hatch. You won't damage the liner as 1500 for a few seconds will only remove a micron or less. Some folks don't touch the liner. If you had a GOOD running motor before and it started going south then just change the piston and rod. That's not the case here, so just start over... Put it back to stock with the shims. A 3 thou under the liner a 8 and 5 thou under the head. This will give you 191 and 19. Go through the breakin again. 5 prop

running just before 2 stroke for a couple runs on the ground. Too rich, no heat, not good. Also if you can add some castor to the breakin fuel. 5oz per gallon is a good mix. I'm on the fence with test stands. do the breakin in the plane, do a couple runs on the ground first. When you fly make sure it stays rich for a dozen runs. This includes the ground runs. I just fuel and go, fuel and go, fuel and go. Do the verano in the air. Load and unload. Cuban 8s, big ones. Don't look for peak until the breakin is done. If all is good you should see high 25s low 26s on the ground.

rs-ssfan » Wed Aug 17, 2016 8:33 am
Rocket you indicate that .003 under the sleeve and .013 under the head will put you at .191/.019. Do you find that to be the case on every engine you set up? I don't, so I'm trying to figure out if I'm doing something wrong when I'm measuring my engines. I have 3 engines, #1 has no sleeve shim and I measure it at .190, #2 has no shim and I measure it at .189 and #3 has a .003 with a measurement of .190. I've measured them both at TDC and BDC and subtracting the stroke and come up with the same measurement.

Thanks,
LF

rs-ssfan » Wed Aug 17, 2016 10:20 am
One more question Rocket, do you look for a prop that gives you the 25s/26s or that should be the judge as to whether or not it's a good engine. In other words on "this" prop I should get low 25s and if I don't there is a problem with the engine and I should get another one.

LF

killerd » Wed Aug 17, 2016 10:24 am
I would agree that while most of the motors might average 187 with no shims, there are exceptions to the norm. I have one is measures 184, 180, and 189 with no shims which RR did reference in the first answer. I totally agree the break in of the motor is extremely important and would admit sometimes there is 1 motor that is just a cut above all others. Thankfully we have a good attrition rate so that pilot has a small window of time to kick but before that combination is in the dirt.

SoCal DK

rocket » Wed Aug 17, 2016 7:35 pm
There's different ways to find tdc. Darrol sells a 20thou shim. Others do their best to get the piston to the top by smashing the motor on wood to drive the piston up higher. You can heat the cylinder with a torch, with the piston at BDC, cylinder is hot and expanded piston still cold you can find tdc before the piston heats up and binds. The easiest way, You can castor oil up the piston and turn it to tdc. Pull the head, rock the prop back and forth you will see the cylinder move up and down. I use head shims or you can use feeler gauges measure the space between the cylinder and case. Now measure tdc from the

piston to the cylinder. Subtract the feeler gauge numbers. This is your unloaded TDC. All the heads are 185 thou. Now subtract the 185 from your final no shim clearance number. If you don't have castor "I use it for all assembly of motors" you can get it at CVS, Walgreens or other drug stores. In the laxitive section for old people or the baby health section, laxative section. Some baby's need help pooping.
Props, another gray area. 28.500 in the air. Rumor has it that's the max rpm the motor will turn. 3000 rpm is what it unloads after you take off. So, 25.5 on the ground is what you should leave at. Again, not confirmed by me just stuff I've heard but sounds right.
Plugs, the N plug works well, but, might not be the best choice for certain setups. Lower timed setups like this plug. Higher timed setups might favor a different heat range plug like the ones available from merlin.

rocket » Wed Aug 17, 2016 7:59 pm
Looking for heat.

Your turning 25 plus otg, planes fast but not unloading hard. You land, check the plug only to find its brown and the element looks like terry fraiser on a 6 pack of cheap beer. Your over compressed. Raise the head 1 thou at a time until the plug is light brown at worst, or still new looking at best. This was the most asked question at the nats. Craig Corsen saw the best results after asking why as did others.

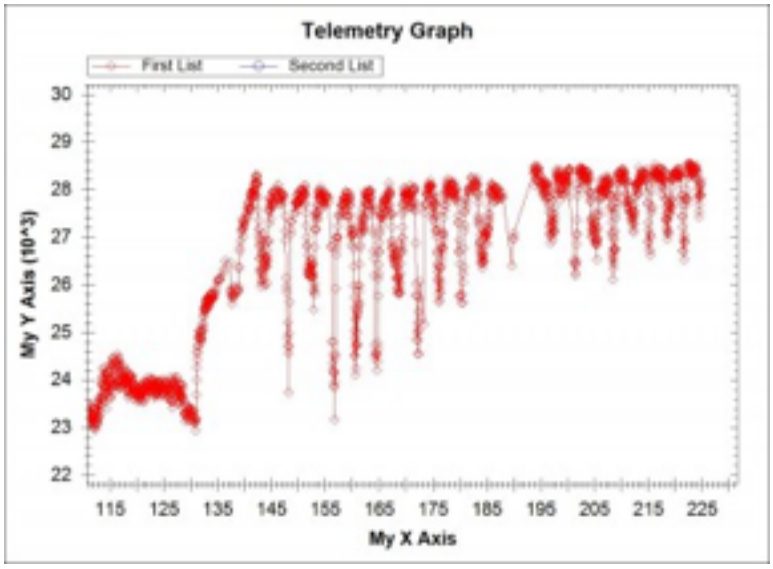
rocket » Wed Aug 17, 2016 8:18
Lonnie, all props are not the same. If your motor is turning lower rpm than what you're looking for By all means try a different prop. If no change try a different plug. Keep a needle or t pin to put the plug element in the middle of the body. An element pushed up against the side or an element that's been squished together by an over compressed motor will yield lower rpm.

rs-ssfan » Wed Aug 17, 2016 8:57 pm
Rocket, thanks for the information.

Your peak RPM comments intrigues me. Let's assume your 28.5 is accurate, it's what I've heard as well so I don't know why it wouldn't be, and you say it unloads 3k in the air so you want to take off at 25.5. Is 3k as much as it will unload or that's the "optimal" unload amount? In other words if I launch at 24.5 will it only make it to 27.5 in the air or will it make it to 28.5 it will just take a little longer for the extra 1k rpms? This is just my curious side coming out.

delateurj » Thu Aug 18, 2016 12:31 am
I just started to want to take the next step in understanding Q40 engine set up so loving this thread.

Only thing I can add is some data regarding last question. Definitely possible to unload more than 3k. I have telemetry on mine and have had runs with 23.3 at launch and 28.3



peak unload in the race. Now whether that is a desirable thing or not...I am still the learning new guy.

rs-ssfan » Thu Aug 18, 2016 8:35 am

Well that certainly is an interesting graph and brings up a ton more questions. It would be interesting to see something like this from all the popular set ups and prop combinations. The only problem is the human on the sticks, you'd have to get someone who's pretty darn consistent in their flying.

Hanknsd Thu Aug 18, 2016 10:16 am
Joe,
What type of rpm sensor are you using and where did you mount it. I have an optical futaba that would work with my s bus.
Regards Hank

Postby **Hanknsd** » Thu Aug 18, 2016 10:23 am
Ray,
I have a stupid question. When you say Mothers polish, is there a specific kind or do just look for Mothers polish.
When you say 1500, is that paper or steel wool?
Hank D

fizzwater2 » Thu Aug 18, 2016 11:10 am
is this the stuff?

http://shop.advanceautoparts.com/p/moth ... rs+polish#

rocket
Yep, that's the polish. The 1500 is sand paper. Wet/dry. 2000 is good too. don't polish it to a mirror, just clean off the carbon and cleanup the sides.

rocket
28.500

after looking at joe's chart it would seem the 28.5 is accurate. question for joe d. what was your peak rpm otg.

rs-ssfan » Thu Aug 18, 2016 3:24 pm
Judging by the graph I'd guess 24.5, shown right after start up.

delateurj
I tend to not peak on the line, I am more of set based on last needle and lean out a little if plug looks I can and not sure what it peaked at last time I bench run.....so can't really say what peak on the ground.

That initial peak on startup is not me peaking. This engine has a tendency to want to jump on the pipe hard right at the start even a half or 3/4 of needle open from my set point. I use thumb partially over venturi to quickly get it a little rich until it warms up and then position set, so bottom line, wouldn't read much into anything before launch.

I am using the Spektrum backplate sensor which is a hall effect sensor that detects crank pin. Zap a dap goo'd into the backplate.

rocket
Thanks joe. The jump on the pipe is the result of no tank pressure at start up.
Based on the 3000 unload theory if it's correct your ground peak rpm around 25.3. The needle setting or rpm you left at obviously lower. More food for thought, the gray area of needling a motor. Been playing with the cold start. Preset needle, motor choked at startup until a couple seconds before the flag. The reason being if you start and let it run on the pipe for the 45 seconds your letting the motor heat up. Then your needling a motor at operating temp. This will cause a rich needle setting. To qualify that, after you have flown while needling and letting the motor heat up, now, with the needle in the same position, start it choked, keep it choked for 30 or 40 seconds pull your finger off the venturi and push it. It will fly rich all 10 laps. Now, finding the rite needle setting for this type of start. After you have done the two flights mentioned above, your next start, with the needle the same, choke it, let it run 30 or 40 seconds to simulate a heat. When you pull your finger off it should be running rich. Turn the needle in until it hits the pipe and shut it off. After it cools fly it again. go through the start sequence again. This time when you pull your finger off it should hit the pipe hard. its important that only a couple seconds are left on the clock before you pull your finger off and push. Don't let it sit there and run. Now your first lap is on the pipe and running. the motor never gets a chance to heat up and if everything is good it should run all 10 laps hard. All of this is just another option of finding more speed. It will work for some but not all.

rocket
Here's a link to a YouTube video using the choke. Check out the first lap.

https://youtu.be/dcdwkEdJ9o8

vonderhey » Fri Aug 19, 2016 10:18 am
Do any of you self proclaimed experts own a degree wheel?

rocket » Fri Aug 19, 2016 11:51 am
Dont see any self proclaimed experts. That was the next thread.
Maybe you could educate them.

rocket » Fri Aug 19, 2016 10:14 pm
Well, lee, we're waiting. Dazzle us with your brilliance.

vonderhey » Sat Aug 20, 2016 2:12 pm
Well let me start with an apology for the sarcastic classification of all of you that are trying to figure out how to find that optimum set up for the Nelson Q-40 engine. I have to admit that the term "Scientist" would have been a little better. Never the less a degree wheel can give documentation on the "seal to fit" relationship. Ultimately it should seal and hold that seal with very little friction induced between the piston and the sleeve. This information that the degree wheel can give you is just one of over a hundred things that can help with

the refinement of finding the right set up. Also an additional note: Telemetry can be a bit deceiving, If an airframe has more drag or is not as rigid the numbers could be off. An airframe with more drag or is less rigid can show that the engine might not unload as much or as quick as it should. However it is a good way to determine which airframe the engine likes more. Von Der Hey.

moe4sho » Sat Aug 20, 2016 6:44 pm
Hey Kurt, see what happens when you ask a question?

vonderhey » Sat Aug 20, 2016 7:40 pm
This info is directed towards Kurt but would work for all. You can call up Mike @ APM and order the set-up that I use. .192 & .019 . Ask for no glue in the crank and the piston fit @ . 280 to .290 Break it in just like Ray says and race it with a 7.4 X 7.5 After a few runs you should be leaving the ground around 25K to 25.5K Ray is right when it comes to the piston / sleeve fit. As accurate as Mike makes all of the engine parts the chroming and fitting is the biggest variable with these engines. However Mike makes them as good as they will ever get so just about every engine that leaves his shop is a sub-minute engine. Along with all of this information I must stress that a .58 engine will only go 1.04 or slower in a bad airframe. Having the front of the airframe rigid is as important as having a sub-minute engine. Von Der Hey.

rocket » Sun Aug 21, 2016 4:32 pm
Thanks lee.

Stiff nose and fuel tanks..

The nose of the plane being as rigid as possible has a couple benifits. One, the motor is spinning at 28+ "or trying to" the vibration caused by the motor is harmful to the longevity of the piston/liner fit. Picture the piston traveling up and down, now, add a side to side vibration. The first thing it will do is kill rpm, the second it kill any possibe piston fit. If you used said airframe to breakin the motor, the motor never had a chance. Two, I also believe this additional vibration can cause the rod to fail prematurely.
Lee is a very smart @$$ modeler. I had an issue in PHX, ran it past him and got the answer immediately. The question was, the motors in one plane were bullets and in this airframe their burning up. He said the motor mount isn't tight and the blind nuts were the cause. I said I tightened them, he said "yeah against the mount". I pulled the now nogood nelson out and I'll be dammed. Blind nuts tightened against the mount. Pulled straight through the firewall from repeated tightening. He's the reason I use backplate rings. The beam mount should be anchored on the nose as well. A 6/32 sticking out half inch or more and some slow cure thickened up is what I use.

Fuel tanks and air leaks.

Take your favorite tank out of the plane, or, before you install it. Evacuate the bag. Now, plug the pressure line. Put the plunger half way on your favorite syringe. Hook it up to the fuel line on the tank. Submerge the tank in water. Push on the syringe. . If your tank is leaking you will find it here. This test should be done to EVERY tank you plan on using. If your chasing a ghost as to why it runs like crap this is also a good place to eliminate a cause.

rocket » Tue Aug 23, 2016 6:48 pm
Let me clarify the leaky tank post. Basically, pressure test the tank prior to installing it. You don't need to push 50psi into it, push just enough to see if bubbles appear. 10 psi is more than enough. If you see bubbles, rebuild the tank and use fuel proof sealant to stop the leaks.

Fuel tanks and geometry.

Ideally you want the tank in line with the venturi. all 426 and 422 planes have the motors sideways or slightly downward. Which puts the venturi at the same angle. The tank should be mounted with the tank centerline inline with the centerline of the motor. Centrifugal force "going around the poles" causes fuel delivery to change depending on the location of the tank. A tank mounted above the centerline will have fuel forced into the motor causing a rich setting as a tank mounted below the centerline will experience a lean setting. The

flatter the tank the more consistent the run. The jett flat tank is prolly the best choice for consistent runs as the tank has the least height of the commercially available tanks.

Fuel tanks and CG.

When possible you want to mount the middle of the tank "front to back" on the CG of the wing. This will keep the cg from changing as the fuel tank emptys during the flight and all 10 laps will be the same. Some tanks are difficult to mount fuel lines to the front on some airframes. Lots of FAI planes have the tank mounted fuel lines to the back. The design of some airframes have the widest point at the trailing edge of the wing. You will loose NOTHING by mounting the tank butt first and running the fuel lines up past it. If your hangup about mounting the tank backwards is the fuel line ID and restrictions, run the bigger ID lines.
If you have ever flown against Dr Roy and he handed you your arse, you got beat by a tank mounted backwards. There, feel better knowing someone who does it.

Hanknsd » Wed Aug 24, 2016 2:54 pm
Ok Mr. Brown,
I had an engine running very strong. It dropped about 300 rpm. Probably ran hot.
If I understand your engine cleaning procedure, I would polish the piston with Mothers. A my mother is no longer with us, I will do it alone. When you say polish the piston, do you mean the top of the piston only, or do you polish the side of the piston as well?
The top is not peppered.
The head does have some black. Do you use the same polish for that?
As far as 1500 on the sleeve, you say oiled 1500. I assume you are talking about some castor or equivalent on the paper.
What do you use for overall cleaning and flushing?
Thank Ray, I mean Mr. Brown.

rocket » Wed Aug 24, 2016 7:51 pm
The sand paper I use to clean up the cylinder I cut a piece big enough to overlap it's self when it's opened up inside the cylinder. Using a finger inside the sandpaper roll the cylinder back and forth with the palm of your hand while moving the oiled up sandpaper in and out. The mothers is to clean up the piston. Don't polish to a mirror, just enough to make it look like new. this won't work on a piston that has lost it's fit. If there's no bite left you need a new piston. If there's still a pinch sometimes it can be salvaged. Remember you need to break it in again. I'll do a video and post it on here tomorrow.
And I said, here am I send me.

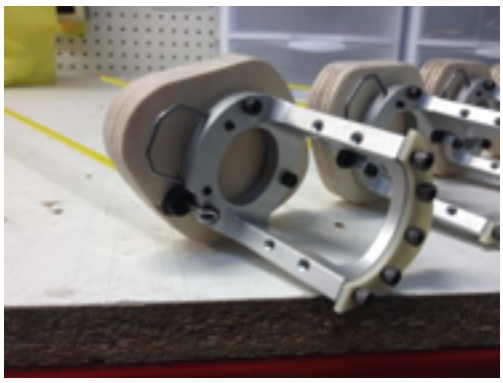
rocket » Wed Aug 24, 2016 7:53 pm
Yes, you can clean the head with the mothers. Castor for assembly lube.

DaveG
Ray
Where do you get your Backplate rings ??

DaveG » Thu Aug 25, 2016 1:52 pm
Anybody have opinions on remote needles vs. venturi needle setups

rocket » Thu Aug 25, 2016 8:38 pm
H n M has them as does Adam argus.we should get dub and mike l to make them as well. If your handy you can make your own.I've made a couple from old beam mounts. Cut the beams off, drill and tap to match the bolt pattern, then drill s#!+ loads of lightning holes in it.

vonderhey » Fri Aug 26, 2016 5:14 pm
Aero Precision Machine makes the nut plate and an engine mount that I use which has five front hold down screws which mount to a G10 plate which in turn is all glued to the front of the fuse. Ask for the Von Der Hey mount. Von Der Hey.


vonderhey » Fri Aug 26, 2016 5:53 pm
Here are a couple of photos of the mount I use. Also a solid test stand is a good idea to have. Never ever peak an engine on the test stand just to see what it will do. You will hurt it. Adding an additional 10% castor oil to the fuel really helps with the break-in process as well. All of this is no secret it's just a lot of work. Von Der Hey.

Kurt Bozarth » Fri Aug 26, 2016 6:54 pm
Lee Vonderhay's test stand in nicer than my bedroom furniture.

iamtom » Fri Aug 26, 2016 7:09 pm
That is a lot of bolts just to stabilize the plastic shell in front of the firewall. Just don't get it. I have seen the glass nose vibrate like crazy without tying it to the mount.
The web from beam to beam is nice dut dosen't the motor tie the beams together when bolted in place. I think you get little from the front end. Models with full nose rings are a bit stiffer in front but still a plastic shell offering little support fot the beast.
Just my thoughts.

vonderhey » Fri Aug 26, 2016 8:35 pm
The theory on the front cross beam is a simple one. It gives much more glueing surface from the mount to the G10 board so that things don't vibrate loose after numerous flights. Also it does stiffen the front end even more when it's incorporated into the front of the fuse.
All of the hints that I have posted are things that have helped me with my race program. These hints might not work for everyone. If there are other or better ways to accomplish the goal of more speed, then by all means use them. Von Der Hey.

rocket » Sat Aug 27, 2016 6:44 am
Tom has been on the fence about front mounts as long as I have known him. But we still love him.
Bet you get no distortion of the case with the N mount.

RB » Sat Aug 27, 2016 7:26 am
I believe Tom's main question/interest.. Is why the need for 5 #6 screws to hold the fiberglass cross beam adapter in place.? I assume you tie the fiberglass beam to the side of the fuse with carbon filled epoxy? And with the mount already having a aluminum cross beam...why not just bond the aluminum cross beam without the fiberglass adapter? what do you lose structurally by not having the fiberglass adapter in place?

Cheers,
Randy Bridge

vonderhey » Sat Aug 27, 2016 11:56 am
When I posted this information I was only trying to share the things that I fell that have helped increase the performance of the engine and airframe. Again this is only my opinion. I am a truck driver, not an engineer, scientist or genius. Good luck, Von Der Hey.

rocket » Sat Aug 27, 2016 12:37 pm
I have to agree with kurt. That's one nice test stand.

Lee, can you elaborate on why no peak on the test stand. My thoughts are a solid test stand would prolly give you the most accurate rpm.

iamtom » Sat Aug 27, 2016 2:00 pm
I don't disagree with the ring type nut plate but if secure when you tie down the front to the fuse and several flights later you snug up the mount you could pull thd front loose. Stabilizing the front shell is not a bad idea but little gain for the mount. Good solid firewall install is most important. If, when you glue the mount in, you pack the holes in front of the blind nuts with epoxy the blind nuts will not pull through. Always grease the bolts befor you do final install. Service is golden.

Bruce Coffey » Sat Aug 27, 2016 4:05 pm
I thought that the ring type nut plate sold by Terence was the best. It was an aluminum ring with lightening holes and PEM nuts pressed in. Surely there are still some of these around???

kane » Mon Aug 29, 2016 9:35 am
I have never greased the bolts on my mounts. This goes way back to F1 and QM15 days. I was told that everything needed to be solid and if done right they shouldn't come loose. I roughen up the back of the mount, fill the blind nuts with epoxy and the front of the firewall. Install the mount (glued in place) and tie down the front. I have used 1/2 rings like Lee. I have used two bolts glued to the nose like Lyle. I have had mounts come loose, I have had airplanes last 30 seconds. I have airplanes last years. In the end it is all personal preference. I do believe tying the front down using either method is better than not doing it.

DK

diggs_74 » Tue Aug 30, 2016 2:22 pm
I haven't been racing Q40 for all that long so I may be all wet in my reasoning.. I always tie the mounts down because any vibration created was done so at the expense of power.. If something is shaking, spinning, rattling, etc, it is only doing so by converting the power from the engine into those movements.. If the power is going into those movements, it's not going into the prop.. Not saying this is correct, just what I've always been told or done myself.. So, for me, the mount is part of the air frame, never to be removed..
Lee LaValley
NMPR# 33w
www.ncplracing.org

AlexVazquez » Wed Sep 07, 2016 1:49 pm
vonderhey wrote:
This info is directed towards Kurt but would work for all. You can call up Mike @ APM and order the set-up that I use. .192 & .019 . Ask for no glue in the crank and the piston fit @ .280 to . 290 Break it in just like Ray says and race it with a 7.4 X 7.5 After a few runs you should be leaving the ground around 25K to 25.5K Ray is right when it comes to the piston / sleeve fit. As accurate as Mike makes all of the engine parts the chroming and fitting is the biggest variable with these engines. However Mike makes them as good as they will ever get so just about every engine that leaves his shop is a sub-minute engine. Along with all of this information I must

stress that a .58 engine will only go 1.04 or slower in a bad airframe. Having the front of the airframe rigid is as important as having a sub-minute engine. Von Der Hey.

Hello Lee,
Thanks for your info.

May I ask why you use those piston fit numbers? Is that a piston loose fit? How is the best way to measure?
One more, why don't you use a ramp crank?

Regards,
Alex

DHG » Wed Sep 07, 2016 4:28 pm
I've always wanted to have a "racing program" like Von Der Hey but so far all I get is static. I feel like the little girl in "Poltergeist" .. they're heeeere ....

But, FWIW, I share Tom's skepticism about whether the front tie-downs **alone** really do anything ... and equally so for a continuous nose ring. I'd much rather cut an opening in the nose ring so I can pop the engine in & out without having to remove the prop & spinner. But I can see the benefit of tying down the beams and **also** reinforcing the inside of the shell, at least up to that point, making sort of a Russian speed pan for the engine to nestle in. Seems to me the end result won't be to eliminate all traces of wobble through brute force (we don't have enough resin for that, nor can we afford the weight penalty) but just to quiet things down a bit. If nothing else, this may prevent secondary harmonics that will loosen up bolts, etc.

Once I was privileged to get a close look at one of the F3D airplanes (a Stiletto, I think) that Chip Hyde had used to set a record. I was shocked to see that the front of the mount wasn't tied down -- and it was one of those long mounts, for a rear-intake engine. Maybe he just didn't have time, or balanced his props really well, or flew so much better than everybody else that it didn't matter. But it gives me comfort to know that if I can't learn good habits from the fast guys, at least I've already copied some of their bad habits. Whee, I mount my motors just like Chip!!

rocket ~~ Thu Sep 08, 2016 8:59 am
Think how much faster he would have gone had it been tied down ;-)

kane » Thu Sep 08, 2016 9:08 am
rocket wrote:
Think how much faster he would have gone had it been tied down ;-)

Or... How much faster you could go if you DIDN'T! OH SNAP.

DK

(ONLY ONE MORE WEEK OF BEING THE NMPRA PREZ!!!)

rocket » Thu Sep 08, 2016 9:17 am
Touche DK

rocket » Thu Sep 08, 2016 9:20 am
kane wrote:
DK

(ONLY ONE MORE WEEK OF BEING THE NMPRA PREZ!!!)

In case you haven't heard we're all voting for you as a write-in. You're not getting off that easy.
And I said, here am I send me.

DHG » Fri Sep 09, 2016 11:30 am
Don't think of it as involuntary servitude ... think of it as a personality cult. I've already ordered you a 30-foot bronze statute from Amazon. Tracking says it'll be there tomorrow.


Kurt Bozarth » Wed Sep 21, 2016 1:06 pm
To Mr. Rocket R.,

The information you provided worked incredibly well! I reset the two used motors that were running poorly to your suggested settings and they both ran outstanding. EXACTLY what I was looking for - getting them back to close to stock, easy and predictable needling, and descent Rpms. THANK YOU for sharing your engine expertise! And thank you to all the others who added great info to the thread. My wife now has her work cut out for her in checking and resetting my other engines.

Kurt Bozarth

Sbaker » Fri Oct 07, 2016 1:24 pm
Back a few pages, Randy Bridge asked what harm was there in skipping the G-10 material and just gluing the aluminum mount directly to the fuselage. My first thought was the ability of aluminum to transfer heat, and the affect that heat would have on the glue joint directly to a glass/carbon fuselage shell. The use of G-10 acts as a plenum does on a car engine, where a non-metallic material is placed between the engine's intake manifold and the carburetor(s). Carbs run best when kept cold, so the plenum insulates between the 2 parts. Same goes for the G-10 insulating the glue joint from the hot motor mount. Go get'em Ray at the Championship race!! Steve Baker

rocket » Fri Oct 07, 2016 6:55 pm
Thanks steve, but, I didn't make the trip. I'm passing the torch on Sunday.

rocket » Fri Oct 07, 2016 7:32 pm
Steve, these motors are cooled by intake fuel on the bottom end and air on the topend. The circuit board adheres to epoxy better than aluminum and has nothing to do with cooling or insulation.
Alex, the fits of the piston and liner have to do with expansion when the parts are at operating temps. Ideally you want the piston to seal when hot at the opening of the exhaust port on the way up, at the same time you don't want it still biting as it passes the exhaust port on the down stroke. This extra friction is detrimental to rpm and horsepower.

The "ramp" is witchcraft. Some believe it's a benefit and will give you an edge, some think it's a flying broom. Me... ehhh, I wouldn't know if it's there or not unless I looked. To qualify that, in FAI I've seen stock motors go 55 sec and fully worked motors with ramps go 55 sec.

rocket » Fri Oct 07, 2016 8:20 pm
Reading pistons.
The piston will tell you a lot about the performance or happiness of your motor. Here's an example beit an fai motor of the pinch ring and the fit between the piston and liner. Ideally you want color on the exhaust side of the piston and little or no color on the intake side. This is a visual of the post before this one about the piston fit and the piston still sealing until the exhaust port.

If the piston fit was too loose or the taper of the liner was off or the motor was running hot which is the most common cause you get “Blow-By”.

The blow by all the way around means the hot gasses were passing the piston before the exhaust port opened. This causes hot gasses to make their way back into the intake ports causing the intake charge to enter the cylinder pre heated. This makes a bad situation worse by causing a lean run. A motor running hot can be caused by too much prop loading the motor down. Over compressed and not letting it unload even though ground rpms are good. Ignoring mandatory breakin procedure or in this case leaking plugs.
Side note on the bottom pic and breakin procedures. That piston saw two 750cc tanks on the stand, then one flight to find the needle " it went 59 sec" the next flight it gave all it had and set the FAI world record 55.32 then two more flights at 58 seconds. Randy and I believe the last two flights caused the premature death of this piston as the plugs were leaking causing it to run lean. Had the plugs not leaked it still wouldn't have lasted as long as it would have being properly run in.

AlexVazquez » Fri Oct 14, 2016 12:27 pm
rocket wrote:
Steve, these motors are cooled by intake fuel on the bottom end and air on the topend. The circuit board adheres to epoxy better than aluminum and has nothing to do with cooling or insulation.
Alex, the fits of the piston and liner have to do with expansion when the parts are at operating temps. Ideally you want the piston to seal when hot at the opening of the exhaust port on the

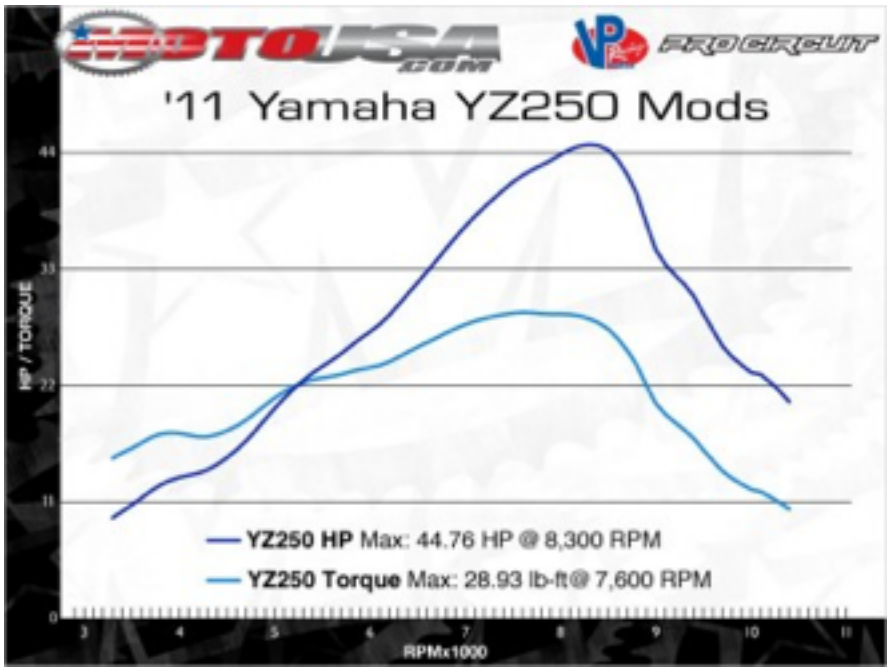
way up, at the same time you don't want it still biting as it passes the exhaust port on the down stroke. This extra friction is detrimental to rpm and horsepower.
The "ramp" is witchcraft. Some believe it's a benefit and will give you an edge, some think it's a flying broom. Me... ehhh, I wouldn't know if it's there or not unless I looked. To qualify that, in FAI I've seen stock motors go 55 sec and fully worked motors with ramps go 55 sec.

Thank you Rocket, all the information is great!
Pylon Racing Mexico
NMPRA 29y
D9 VP

AlexVazquez » Wed Oct 19, 2016 10:25 am
Regarding the propeller and engine performance, I have observed in my few experience (I'm somewhat new with pylon racing settings), that at high rpm (26.5-27 K) in ground you may not reach good performance in the air. I'm not sure where is the best rpm performance range for Nelson engine and I think this also must be variable at different settings, what I'm sure is that all combustion engines gains power and torque with more rpm but this is not unlimited, at some point the engine performance breaks down (example at engine curve graph). By the way, is somewhere a nelson performace curve or someone have made by her own and may want to share?

I've chosen my propellers pitch to see at ground between 24-25.5 Krpm, when I obtain lower rpm then I decrease pitch, and when I reach higher than 25.5K I add pitch. Am I right? I'll be glad reading your opinions

Alex

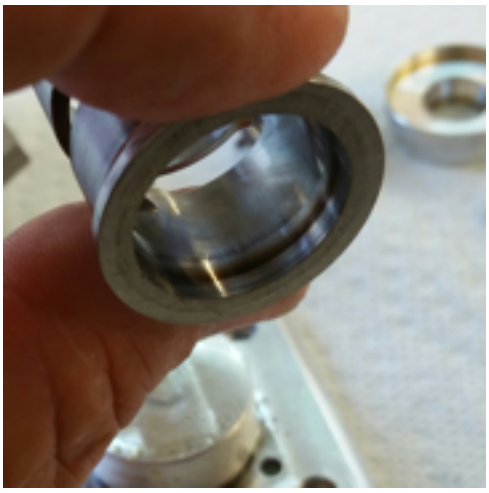


rocket » Mon Oct 31, 2016 1:18 pm
Alex, I few pages back we discussed what's the best rpm on the ground to get the most speed in the air. 28.5k It's believed that's the top of the motors horsepower/torque curve. It's also believed that the motors gain 3k in the air from max ground rpm. So, 25.5 otg should be ideal.

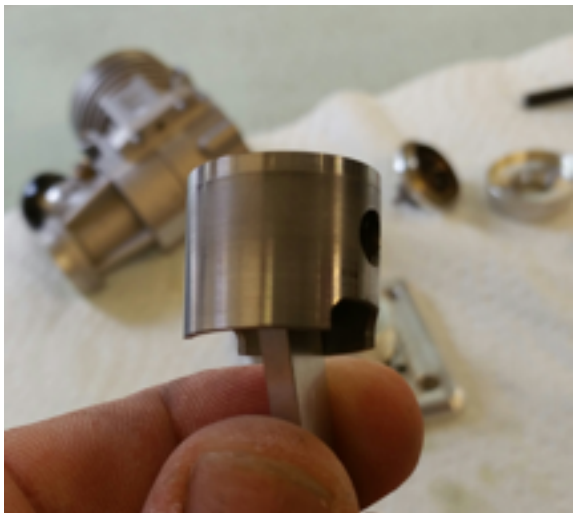
AlexVazquez » Wed Oct 26, 2016 10:43 am
Thank you Rocket!

rocket »
Incase this is illegal I'll leave it on this thread. Some may take offence to "metal" being removed. That being said there are NO performance mods being done to the motor other that re furbing the fits.

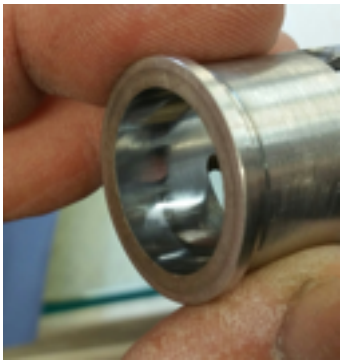
The piston has a nice pinch ring even though it got hot a few times. The liner has a wear band as well. We're going to clean them up.



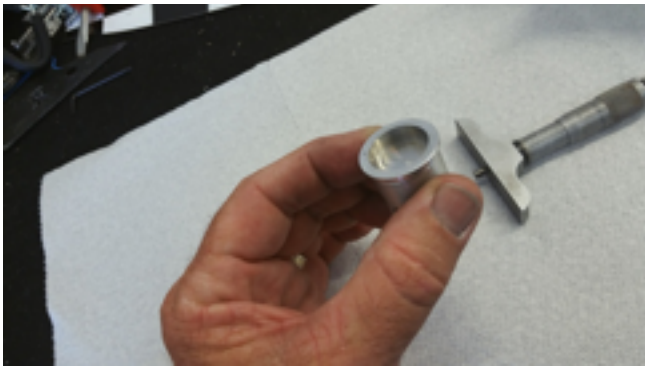
Using Mothers Mag & Aluminum polish, clean up the piston sides and top. Not polishing it to a mirror but just cleaning up the carbon.



With the liner cut a piece of 1500 or 2000 grit wet dry sandpaper. Using a finger inside the liner roll it back and forth on a flat corner of a tabletop or in this case a glass countertop. All the while moving the Sandpaper in and out, applying light pressure form a crosshatch.



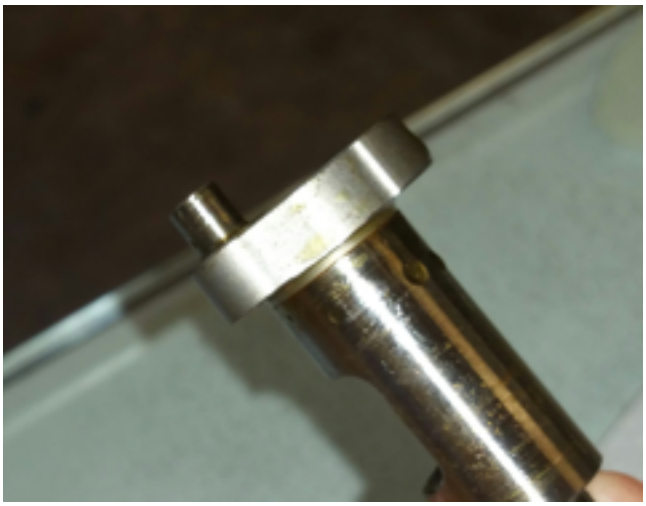
rocket » Mon Oct 31, 2016 1:44 pm
I use brake cleaner to degrease the parts, then with them dry slip the piston up into the cylinder. Applying pressure until it stops. Now using a depth micrometer or the calipers measure the depth. Anything more than 200 thou still holds promise.



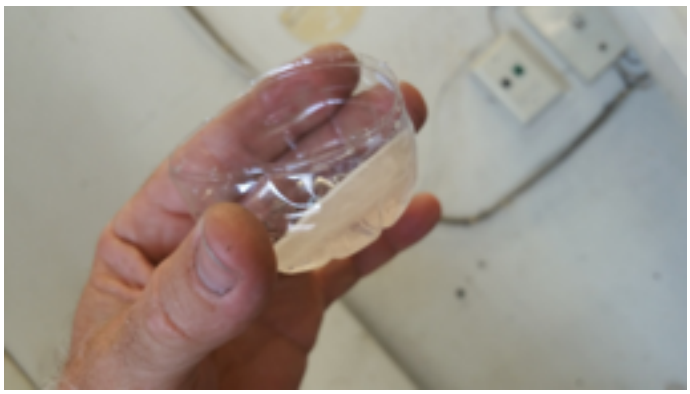
rocket » Mon Oct 31, 2016 2:01 pm
Reassemble after a good cleaning. Cylinder, Piston and pin, crank pin and rod get castor. All uprpose lubricating oil on the bearings and crank.

After run oil and the great debate about it

The oil in the pic comes in spray can, you can saturate the piss out of the motor, and, it will cover ALL the metal inside. Not like putting a few drops of whatever with cheese after run. When I pulled this motor apart I was reminded why I don't use "drops" of oil. Here's some pics showing what drops of oil do in your motor. There exactly that, drops. They don't and in most cases won't mix with the residual fuel left in the motor. And, it won't lubricate the steel bearings or crank



rocket » Mon Oct 31, 2016 2:25 pm
My feelings are pump it full of lubricating oil. Then, work it through the motor until it spills out the exhaust. This insures the residual fuel left behind is mostly flushed out.



This is penetrating oil and Riches brew, NMPRA 15% it's thinner than lubricating oil. Even after agitation it seperated. Do your own test with your favorite after run to see if it mixes. If you're so inclined to use penetrating oil to prevent rust, do the motor a favor and lube the cylinder and piston with castor befor you flip it over or even worse try to start it.

KRProton » Tue Nov 01, 2016 11:07 pm
I've enjoyed reading through this thread – I've gone through it several times and pick up something new each time. Thanks **Rocket Ray** and others for sharing your expertise. I've just gotten into Q40 this year and I know I have a **LOT** to learn. It's very humbling to have been in the RC hobby for about 45 years now (I'm 53 years of age) including four years of pylon racing, but to still have so much to learn in this new venue. But I'm loving every second of it. So now, if it's okay, I'd like to post what's been going on with my Nelson engine to see if I'm on the right track. I think everything is great with the engine, but I welcome advice and opinions.

I purchased the engine new this summer from Mike Langlois. Initial runs were in my Too Sweet on the ground with a 7.4 x 7.7 cut down to 6-1/2" as recommended to me. I blew the plug on the first run. Here is what they look like.

it's perplexing because the oil was dark, but the plug had no color. In retrospect, knowing I knew nothing back then and know more now, I'd guess the exhaust residue is too dark and maybe it was lean that run? The plug was blown, so I put in a new one and ran the engine again. This time the oil was pretty much clear.

I ran it on the ground three more times the same way for a total of five ground runs.

With the assistance of a couple other Q40 pilots needling the engine for me I flew the plane in practice at the race down in Wichita – probably about eight flights total. But I had to shut it down at least a couple of times because the plane was making a strange vibration sound. One of those times I actually thought the engine quit because the plane had suddenly slowed so much. The plug was dark brown on the OUTSIDE from two of those runs. So I put the engine away and borrowed an engine from Lonnie Finch. That seemed to cure the mysterious vibration noise for a while, but it seemed to come back. The plane is history now anyway.

I removed the head and found it to be peppered. I know the guys who were needling the engine for me know what they were doing, but there was something with that plane that just didn't agree with the engine, or vice-versa.

I returned the engine to Mike Langlois and he honed the cylinder and installed a new piston and head. It's set at .190/.018. Mike said with the previous runs I had on the engine it was basically broken in.

I then installed the engine in my new Sweet Vee. This time I added about 3 oz. of castor oil to about ¾ gallon of fuel (first time the engine had been run with added castor). I got some advice from another trusted source to do the first launch for the maiden at about 23,000rpm I think it was. I was on my own, so it was time to be a big boy and needle the engine myself. I didn't want to damage the engine and I wanted to stay far away from anything even resembling a lean run, so I started out very conservatively and launched it around 21.5K. It was nearly hitting the pipe on the ground, so I figured it would come on the pipe in the air. All was well, the engine was great, but I could tell it was rich. The plane flew well and all was normal—no mysterious buzzing noise and the engine sounded good. I flew it five times that day. For the last flight I put in a new plug so I could get a good reading and launched it at around 24K. The plane seemed fast to me and sounded good. I was concerned I launched it a little high on the rpm, but when I came down and looked at the plug it looked good – possibly a little too much color, but okay I think. This is the plug after that flight…

This was also before I learned about reading the pitch of props which I am now doing. I measured the pitch later and it came out to 7.0 (it's a 7.4 x 7.5). A few others I've measured come out to like 6.875, so maybe that 7.0 is a slightly “heavy” prop.

This past Sunday I put the Sweet Vee up three more times – same fuel (with some castor) and same 7.4 x 7.0 prop. First flight I launched at about 24,000rpm. The plug is the same as the one pictured above with the one previous flight also launched at about 24K. Here's the plug after its second flight, first one of this day…

I put in a brand new plug and launched at about 23,500rpm. Another great flight. Much less oil on the bottom of the plane and it was cleaner. Plug had almost no color at all….

So this is my final (3rd) flight of the day last Sunday. Same plug as the previous flight (2nd flight on plug overall). The plug may be ever-so-slightly darker, but the oil deposited on the plane was pretty clear. If it was lean I would think the plug would have been darker and after all, I launched at about 23,500rpm which is a little conservative, yes? In review, first flight launch at about 24k, then a new plug and two more flights at 23,500rpm. All seemed well. Here's the oil on the bottom of the fuse and the plug (Ray's reference to Terry Frazer after a 6-pack of beer?)…

Back at home I removed the head to find a shiny, mirror finish!

So at this time it seems all is well with my engine. With the needle on a Jet engine mount with integral needle valve it's set at about 2-5/8 turns if that means anything. As the element looks a little distorted, I was also advised to consider adding another head shim to change the engine from its present setting of .190/.018 to .190/.019. This sounds reasonable to me.

I think I also have to consider the air I've been flying in; dense air I believe as this time of year it is cooler and humidity is down. That agrees with wanting to shim the head to lower the compression to compensate for the dense air, yes?

So now I'm grading the pitch of my props. I'm happy and content with the engine. My goal at this time isn't to tune the engine to the Nth degree, but to make sure it's on the pipe, doesn't overheat and lasts as long as it's supposed to. I'll give it my all every time out, but I don't expect to compete with Rocket Ray or Dan Kane just yet. It'd be nice to have a competitive, reliable engine where I can hit the needle and be competitive with other guys in my class.

Thanks for any comments you can offer about the needle settings, the plug, or what-have-you.

Tim

rocket » Wed Nov 02, 2016 11:54 am
Cool tip, instead of using a new plug to judge the motor use 0000 steel wool or, mothers mag polish to remove the carbon.

Clean well and use again. This way your apples to apples in your evaluation. Looks like your well on your way to competeing on the next level.

rocket » Wed Nov 02, 2016 12:10 pm
This is with mother's



KRProton » Wed Nov 02, 2016 4:56 pm

rocket wrote:

Cool tip, instead of using a new plug to judge the motor use 0000 steel wool or, mothers mag polish to remove the carbon. Clean well and use again. This way your apples to apples in your evaluation. Looks like your well on your way to competeing on the next level.

That's it Ray? A helpful tip and a compliment? Thanks! Guess I haven't screwed up my engine and I'm on the right track. I was all set to park my Sweet Vee for the season (until Phoenix), but we're still having unusually good weather, so maybe I'll change up that motor to .190/.019 and give it a whirl this weekend.

Tim

rocket » Wed Nov 02, 2016 5:55 pm

Another tip for you and owners of the SV. With the Vtail you can adjust travel volume to keep it tracking through the turns. If it's lifting the nose around 1, add to the starboard stab or takeaway from the port stab. Once it's tracking true you can add to the dual rate to make it turn hard or where your comfortable. No need for wingtip weight.
Check for full travel of the elevators. While holding full up move the rudder L and R. Note the travel up on both stabs. They should move up "past full up elevator " equally, if not the one that doesn't is prolly binding. You won't see this by just moving the rudder or just holding up. Had a plane that I kept adding up elevator to make it turn harder with no success. Then it stopped tracking through the turn. Drove me nuckin futz. Found the problem by accident while playing with the rudder and elevator.

KRProton » Wed Nov 02, 2016 10:39 pm

Thanks for the trimming tip on the Sweet Vee Ray.

Okay, so I got the shims Mike included with my engine out of the package. I have the following:

(2) .001" head shims
(2) .003" head shims
(1) .005" head shim
(1) .008" head shim

As written on the slip of paper included with my refreshened engine, looks like there is a .001" sleeve shim under the sleeve to bring the piston deck height up to .190". Then, without the shim the piston deck height would be .189", right?

And the head protrudes into the sleeve .185" yielding a head spacing of .005". But Mike brought it up to .018" with .013" of shims (I presume a .008" shim and a .005" shim).

So how many shims do you guys carry in your spare parts boxes around to the races? Do you/can you reuse shims as long as they are not damaged or compromised somehow? Are the shims I have now enough to get me through a season of racing, or should I order more?

I presume sleeve shims are different than head shims, so guess I should get a stack of sleeve shims too?

Thanks.

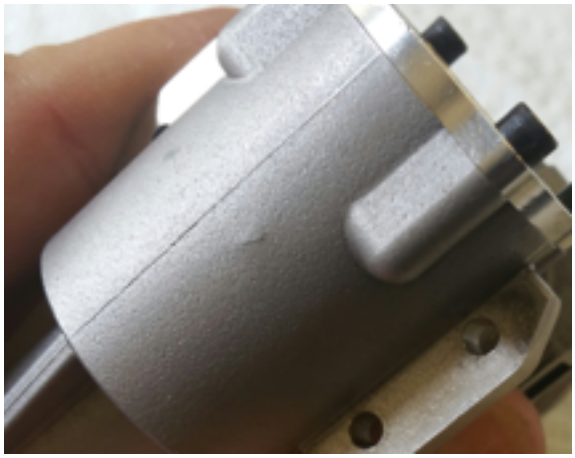
Tim

GaryS » Thu Nov 03, 2016 12:21 pm
I'd keep all my shims in your box that you take with you, as otherwise the one you really need will be sitting on the bench at home. That being said, once you have a good baseline setup, you really won't be changing it much if at all. As long as they aren't damaged, you can reuse them all you need, and yes, the head and liner shims are different (the liner shims have a larger ID to fit around the cylinder).
GS

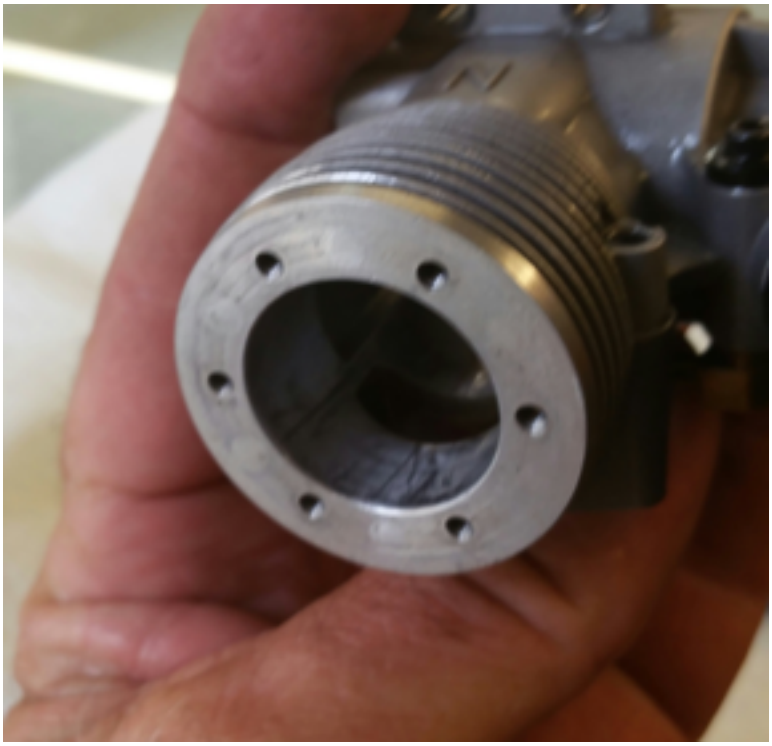
rocket » Sat Nov 05, 2016 2:51 pm
Extended motor life.

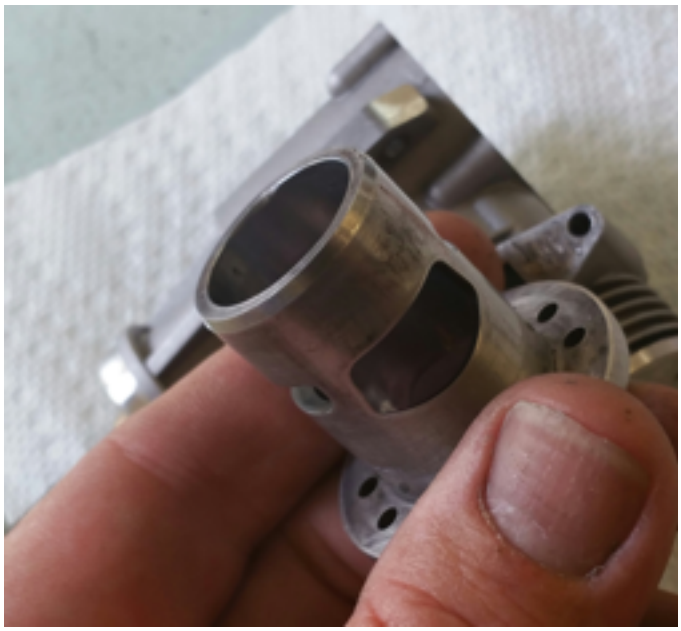
Randy and i were flying at mulberry Sunday. John V stopped by to spectate and as usual a discussion started about motors. We're talking about fits and plays, setups and needling techniques. I told him about a motor I have that's been through more $#!+ and still runs like a bear. When I say it's been through more mmmm I'm talking blown conrod, had to beat the cylinder out of it. A cracked case. just poor overall shape. I also told him it still runs as fast as any motor.

After disassembly, I had to clean up all the debris from the rod. The initial inspection, the case had two bulges from the rod trying to make its way through

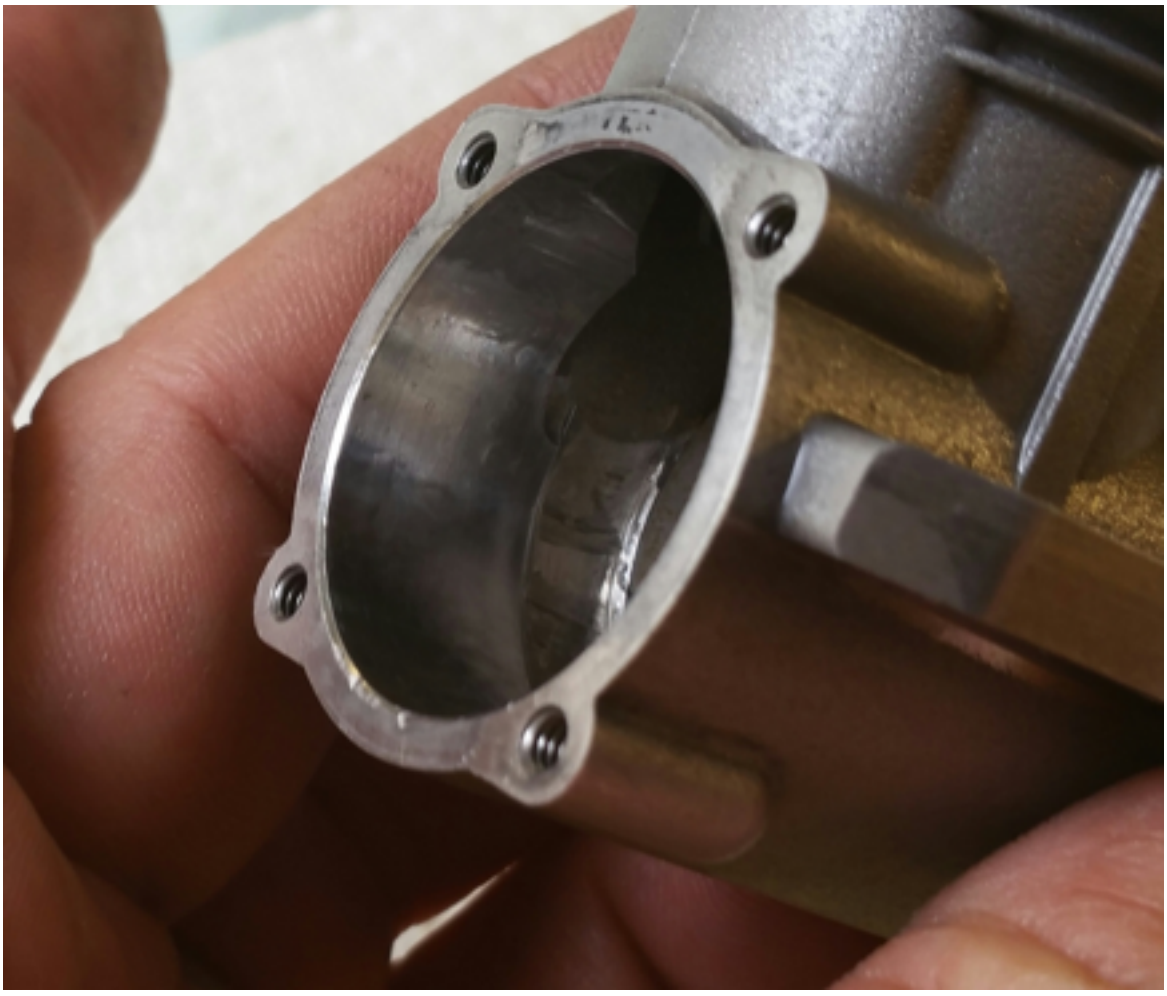


some thin CA in the cracks fixed the leaking. Next was the cylinder. It was fast before the explosion so using it again was definitely worth the fix. The case was scratched when removing the cylinder but test fitting a different cylinder proved ok so no work needed there. The cylinder was oblong from the rod beating it to death so lots of sanding on the two sides to get it back round enough to fit the case. Next was the inside bottom of the cylinder. Some small files and 320 made quick work of the burrs so the piston could pass with out obstruction.





next was the backplate. The rod damaged was not too bad so a little filing to the edges of the case it fit back no problem.



After sanding most of the plier marks from the big flange and a final cleaning and re assembly it's living proof you can still break a minute with another's man's trash

It's setup at no liner shim, 17 under the head. The dry fit is 230 down

KRProton » Sun Nov 06, 2016 12:06 am
rocket wrote:
It's setup at no liner shim, 17 under the head. The dry fit is 230 down.

Hey Ray.

I hate to be an idiot, but I've crunched the hell out of those numbers and I can't figure it out. I must be totally missing something. If the "230 down" refers to the deck height without shims, then, as best as I can math it out , that engine is setup at .230/.062:

.230 deck height minus standard head protrusion (assumed) .185" = .045" plus .017" shims = .062".

That ain't right. So what am I missing?

Or, I'll just forget about the .230 and **assume** standard deck height without shims - .188" and standard head depth of .185". Then, the engine is .188/.020 (.188" deck height, no shims, minus .185 head depth plus .017" shims = .02").

Tim

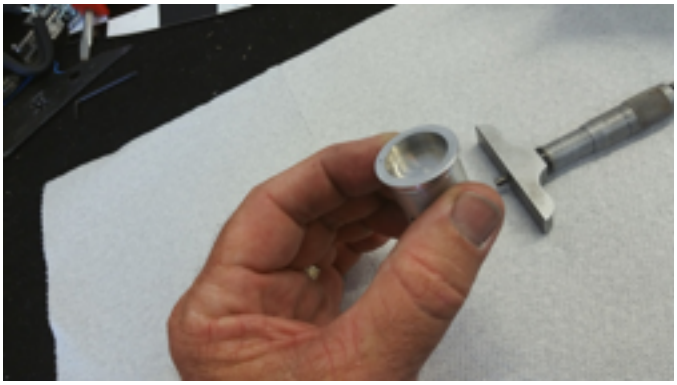
rocket » Sun Nov 06, 2016 3:28 am
Lol, sorry tim. I was referring to where the piston grabs the cylinder. It's a very loose fit. Part of the discussion john and i were having. The no liner shim and 17 under the head is 188/20

rocket » Sun Nov 06, 2016 4:01 am
vonderhey wrote:
This info is directed towards Kurt but would work for all. You can call up Mike @ APM and order the set-up that I use. .192 & .019 . Ask for no glue in the crank and the piston fit @ .280 to . 290 .

Tim, Lee refers to it here. Most piston are fitted much deeper. This "fit" in lees quote is . 100 shalow of where you would normally get one from the manufacturer. By doing this you reduce the friction between the piston and liner. this allows the motor to unload harder. The motor in the pics has a fit of .230 you find this fit as illustrated before by cleaning off all the lubricating oil "use brake cleaner" from the piston and liner. Then you "push" the piston up into the cylinder until it stops. Measure the depth and you have the "piston fit". It's believed a looser fit is not going to last as long a tighter fit.
And I said, here am I send me.

rocket » Sun Nov 06, 2016 5:32 am
rocket wrote:

I use brake cleaner to degrease the parts, then with them dry slip the piston up into the cylinder. Applying pressure until it stops. Now using a depth micrometer or the calipers measure the depth. Anything more than 200 thou still holds promise.



KRProton » Sun Nov 06, 2016 7:26 am

Ahhhhhhhhhhhh, yes, the fit of the piston in the cylinder. I do remember reading about that in previous posts in this thread. Thanks for copying in your answer to me.

First then, my assumptions of typical deck height without shims being .188" and typical head depth of .185" are correct leading to my correct calculation of the engine with no sleeve shims and .017" head shim is set up as .188/.020.

But according to what Lonnie Finch wrote back on the first page or so, you can't really assume that all engines will have a sleeve height of .188" and a head depth of .185". According to Mike Langlois, my engine required a .001" sleeve shim to get it to .190". So my engine without sleeve shims is .189". Looks like my head is .185" though.

Okay, now to the dry fit;

Of course. Now I remember; measuring the depth of the piston in the sleeve when totally cleaned with break cleaner or whatever ("dry," no lubrication).

If most pistons are fitted deeper than Lee Vonderhey's preference of .280 to .290, and this is .100" shallow of a standard fit, then a standard fit must be around .380" - .390". Of course, the looser (shallower) fit yields less friction and more rpm (unloading) then. At first thought I would think a looser fit would last longer than a tighter fit because there will be less friction and wear. But as, apparently, this is not the case, the looser fit just has less to go before it comes **too** loose.

Yes, I see that the .230" would be a very loose fit. I also see where Ray wrote anything greater than .200" holds promise.

Okay, now I've put it all together and it all adds up.

Thanks guys!

Tim

Another question about shimming;

Once you know your engine setup without shims, could you/do you then just do the math and add/subtract shims to get the desired setup without re measuring?

For example, I don't have a depth micrometer (yet) and haven't measured my engine myself (yet). But, again, according to the documentation from Mike Langlois with my engine, it's set up at .190/.018 with .001" sleeve shim and .013 head shim.

Then, without a sleeve shim my engine must be .189" deck height (deck height minus shim, or .190" - .001" = .189").

The head depth without shim = the deck height - piston/head clearance with shims + head shims. The head depth of my head without shims must be .190" - .018 + .013" = **.185"** head depth without shims.

So, if I know my base engine setup with no shims is .189 deck height and .185 head depth, do you just start adding/subtracting sleeve/head shims to get the new setup you want without re measuring?

Let me guess the answer now that I've thought about it; It's up to your personal choice and whether or not you trust your math. Might be a good idea to check by actually re measuring - especially if you're changing both the head depth/head/piston clearance **and** deck height at the same time. Or if you're adding/subtracting lots of shims.

In my case, where I want to make a small change from .190/.018 to .190/.019 it's easy and all I need to do is add .001" head shim and forget about it.
You wouldn't re measure then, would you?

Tim

rocket » Sun Nov 06, 2016 10:55 am
Correct. The heads are ALL 185. once you have the basic numbers of the motor there never gonna change unless you change a component. The next discussion will include the degree wheel that Lee talked about. But the phins are about to whoop the jets and there's honeydoos so later.
And I said, here am I send me.

cbk07 » Sun Nov 06, 2016 11:57 am
Ray, I have a couple of quick questions.....when pushing piston to top of sleeve, how hard should I push? and do you have the number we should be looking for on a Jett 426 motor with piston pushed up dry?

Thx Craig

rocket » Sun Nov 06, 2016 4:09 pm
push it hard enough that it wont move anymore but only with your fingers. i think jett likes it around 395 but i might be wrong. we should ask him.
And I said, here am I send me.

cbk07 » Sun Nov 06, 2016 5:38 pm
Sounds good. Thank you

KRProton » Sun Nov 06, 2016 5:48 pm
Couple of flights on my Sweet Vee again today. Wasn't expecting to be flying these things this time of year, but another beautiful weekend here in the Midwest - my wife launched again for me too!

My setup is now .190/.019. Still running the gallon of fuel with castor added. Prop is 7.4 x 7.5 that measures out to 7.4 x 7.0.

First flight I launched at about 24,500rpm. New, used plug cleaned up with Mother's like Ray showed. Nice flight. Landed, pulled the plug. Element was pulled and color darker than I would prefer I think. Again, I think the residual after-run oil in the engine may have contributed to the darkening. ???

Second flight, another cleaned, used plug. Backed it down a bit and launched at about 24,000. After starting the engine and ready to launch, I inadvertently hit the kill switch and shut the engine off before launch. I fueled it up, richened the needle just a "click," started and launched. Another nice flight, nice landing and all.

This time the plug was good.

Maybe in the cooler, less humid air (heavy air) I need to back away on the rpm a bit.

Well, tonight I'll break-down the engine and oil it all up until Phoenix I suppose. I'm pleased with everything now. (Gotta add the checkers to the other side of the wing and the stab too!)

KRProton » Mon Nov 07, 2016 6:56 am
Breaking down my engine to clean out any residual glow fuel, have a look-see and lube it up - piston and liner look fantastic. Any light (and I mean VERY light) browning/coloring washed right off with some brake cleaner and a paper towel.

But say, **how do you get the crankshaft out of a Nelson**? A few good taps with something friendly like a little wood mallet or something?

Thank you.

Tim

fizzwater2 » Mon Nov 07, 2016 9:18 am
I've started using my drill press as just that - a press. Either close the chuck completely, or put in a dowel & chuck it up tight, put the back end of the case on a wood block and press the crank rearward - after removing the prop drive and collet, of course
I don't like the idea of beating on the front of the crank with a hammer..

KRProton » Mon Nov 07, 2016 10:26 am
Hmm, so then, this sounds like a procedure you would do only when replacing parts (such as bearings or the crank) - the crank doesn't just drop out like a regular 2-stroke glow

engine. I was simply breaking down my engine to clean and oil it up for storage. Crank removal shouldn't be necessary in this situation,then, yes? I'll just thoroughly spray the inside with brake cleaner to flush out any residual glow fuel, then follow up with lubricating oil (and castor on the piston/liner, both ends of the rod).

That how you do it?

Tim

fizzwater2 » Mon Nov 07, 2016 11:01 am
I wouldn't pull a crank just to clean it, no. That's me, though - others may feel differently.

I figure if it's not broke, don't fix it...

rocket » Mon Nov 07, 2016 11:02 am
its the front bearing holding the crank back. its due to machining. some snap in some don't. put the threaded end of the crank through the front bearing from the front and you can see where it binds. I chuck the crank up in a drill, turn it with some 1500 a little at a time until the shaft "snaps in place by hand." it wont take much. you absolutely have to feel endplay after assembly, if you don't the front bearing is the culprit.

rocket » Mon Nov 07, 2016 11:11 am
fizzwater2 wrote:
I wouldn't pull a crank just to clean it, no. That's me, though - others may feel differently.

I figure if it's not broke, don't fix it...

its a good idea to remove the rust on the crank where the front bearing meets the front of the shaft. jima believes this is the cause of the shaft leaving the crank. the rust starts a crack, the crack festers into a frontend saying seeya to the rest of the motor. I have to agree. seen it first hand with a rust ring around the newly broken metal. the other reason the shaft departs is there's no radius between the crank and shaft. meaning there's a 90* between the face of the crank where the bearing meets the shaft. you have agree with this too.

KRProton » Mon Nov 07, 2016 11:42 am
Well, this brings up a whole 'nother topic; **How do you care for/clean up an engine?** And what procedure for just after a weekend's racing, and after the season for long-term storage for a couple of months? After Wichita I saw Duane Hulen completely tear down his

engine and was cleaning it up/lubing it before he even put away the rest of his stuff. I'm on-board with that (probably wait until I get home though).

If you can get the crank to drop out by hand, then it would be easy to do so after each weekend's worth of racing – drop the crank and flush out the entire engine, lube/oil up for next time.

Sorry to need so much hand-holding, but if the information is out there...and this is my only source. I'm sure there's no single, right way either.

In my case, I think I will press out the crank and have a look-see. Maybe there's just some rust holding up the crank on the front bearing. If so, that'll clean up easily. Or, if necessary, do as Ray suggested and clean it up with some 1500.

Tim

rocket » Mon Nov 07, 2016 11:50 am

you want it to snap in. just built another N motor and the crank snapped in w/o any help. others need a hammer, you shouldn't need a hammer to install a crank. no tools other than the allen to break it down to the case with bearings.

KRProton » Mon Nov 07, 2016 11:35 pm
Hey, it worked! Just like Ray said!

Thanks Ray!

Tim

rocket » Tue Nov 08, 2016 3:45 am
I talked to Mike about it. His response was Henry likes them tight. And as mentioned before, some snap right in but most needed to be whacked with a tool. Even seen people bolt the prop on, install the spinner then whack the spinner with a blunt object to "seat" the bearings. Your motor will thank you.

iamtom » Tue Nov 08, 2016 6:19 pm
Be careful boys. You run the risk of your motor becoming Void. No metal removal. Stock means stock. What you are allowed to do to your motor is in the rule book.
Just sayin!! You also are posting on an a website where many visit.

DT » Tue Nov 08, 2016 7:07 pm
Tim in your video it appears your fuel inlet is positioned incorrectly! It should point straight back as the inlet hole is positioned on an angle! Take a look you'll see what I'm talking about.

Dan

rocket » Tue Nov 08, 2016 7:15 pm
iamtom wrote:
Be careful boys. You run the risk of your motor becoming Void. No metal removal. Stock means stock. What you are allowed to do to your motor is in the rule book.
Just sayin!! You also are posting on an a website where many visit.

Nope, no performance enhancing mods. If it's an issue send it mike and tell him to do it..

rocket » Tue Nov 08, 2016 7:17 pm
Good eye dan...

KRProton » Tue Nov 08, 2016 8:13 pm
Thanks for the tip Dan and for the words of caution Tom.

The thought of gaining any performance advantage never even occurred to me, but sure thing; rules are rules. I'd just like my engine to last as long as whatever it's supposed to. And I hate to think I'd be contributing to another new guy like myself doing anything illegal to his engine, so I deleted my video. I'll be more careful now. Tim

rocket » Wed Nov 09, 2016 6:25 am
Tim, what I was showing you is a do it your self fix to a machining tolerance. No crank grinding, no case grinding, no timing changes. All of which are illegal. The rules say no metal removal, we'll it's a gray area. When you clean a piston your removing metal, when you wipe off rust your removing metal, when you clean the face of the backplate after a crash your removing metal. All of which are acceptable. Maybe I should have put a disclaimer for the option to send it back to the manufacturer to preform this lol, illegal engine mod. That being said, if you opt for the ceramic bearings "which are legal to use" the tolerance on those fit tons better than the Swiss balls. Remember, from new, some snap in some dont. Hell, just buy some xtra bearings and see which fits better.

rocket » Wed Nov 09, 2016 12:50 pm
Ordered some parts today from mike. We spoke at length about the front bearing tolerance. Mike tries very hard to keep the motors as exact as posdible. But, and I don't blame him, he won't comment an anything about the do it your self ers. At APM they press all the cranks in. An alternative to making the parts fit better during assembly is to freeze the crank and heat the case. Just like you would when installing new bearings. Mike also said to never use a "hammer" to install or remove a crank. The balls will get damaged and you will need a new front bearing. So tim, if I caused you to do something you deem illegal and feel like you have been used I apologize. It was not my intent. I don't now and haven't for a long time ground on a motor. All completely stock.. so I'd like to replace your longstroke with a new one from mike. If that's ok. I'll take your old one and put it to good use. Message me.
Ray

KRProton » Wed Nov 09, 2016 1:17 pm
rocket wrote:
Ordered some parts today from mike. We spoke at length about the front bearing tolerance. Mike tries very hard to keep the motors as exact as posdible. But, and I don't blame him, he won't comment an anything about the do it your self ers. At APM they press all the cranks in. An alternative to making the parts fit better during assembly is to freeze the crank and heat the case. Just like you would when installing new bearings. Mike also said to never use a "hammer" to install or remove a crank. The balls will get damaged and you will need a new front bearing. So tim, if I caused you to do something you deem illegal and feel like you have been used I apologize. It was not my intent. I don't now and haven't for a long time ground on a motor. All completely stock.. so I'd like to replace your longstroke with a new one from mike. If that's ok. I'll take your old one and put it to good use. Message me.
Ray

First of all Ray, I already sent you a complimentary PM before you wrote this post. 

Second, no way buddy! I LOVE my engine! I'm perfectly happy with it and confident enough that all will be okay here regarding the crankshaft. Plus, it's all broken-in and running swell!

Third, I'm a big boy and can take responsibility for my own actions. The rules are published for all to see and I need to make myself more familiar with them.

Some day I hope to have enough experience that I can share my knowledge instead of sucking it all up.

Of course, I understand your intent 100% and mine was the same with my video - just to pay it forward a little with an instructional video for the next guy. I think we're okay here and I'm quite happy and content with everything. And you're certainly one stand-up guy! I'm good if you're good - and go check your PM!

Tim

rocket » Wed Nov 09, 2016 2:40 pm
Thanks Tim. The messages I received from others thanking me and other contributors to this thread is cool. Little tricks and trinkets and whatnots really make a difference. Especially re using old parts. This stuff ain't cheap and if being able to refurbish used parts is something that keeps folks racing then by all means have at it. There's a lot of black art in pylon and we're always learning.

KRProton » Wed Nov 09, 2016 4:48 pm
I don't think that needling the engine, typical maintenance, reading glow plugs and understanding deck height and piston/head clearance need to be black art. When I got my engine it came in a bag. If there were more guys like you around, pylon racing -- or at least Q40 -- might be more accessible. Then guys like you would have even MORE competition to stomp on! I mean, the class could grow.

Okay, now I'm pontificating. Better get outta here - I got some graphics to go cut!

Tim

P.S. For those who cannot remove their crankshaft by hand and press it out with a press or drill press or whatever (and therefore cannot thoroughly flush out the bearings), it would be interesting to know how you prepare your engine for storage between races during the season and how you prepare them for storage longer-term in the off-season.

KRProton » Thu Nov 10, 2016 6:19 pm
Say,

I ordered some various spare parts for my Nelson (package received - thanks Mike!). The bag containing the head is labeled **.8014** as shown. This is the diameter of the button (?) portion of the head that protrudes into the sleeve. Why is this dimension significant? Is it to be matched with a sleeve of particular dimension? Or, is it just confirmation that it's what it's supposed to be?

Thanks.

Tim

sahartman21 » Thu Nov 10, 2016 6:42 pm

KRProton wrote:

P.S. For those who cannot remove their crankshaft by hand and press it out with a press or drill press or whatever (and therefore cannot thoroughly flush out the bearings), it would be interesting to know how you prepare your engine for storage between races during the season and how you prepare them for storage longer-term in the off-season.

I've had good luck by flushing the engine with lighter fluid (or camp fuel*) after the race. Then I follow with drops of after run oil (machine oil). The idea is to flush out the fuel and any nitro to reduce rusting of bearings.

*Note: Mike Langlois recommended the Coleman Camp fuel

rocket » Fri Nov 11, 2016 7:23 am

Kerosene, when my diesel motor in my pickup truck was rebuilt I couldn't believe how much rust was inside the injector lines. Those lines live in diesel fuel where did the rest come from. Completely flushing the motor with anything it's probably still the best bet. The lubricating oil in a spray can with the little black hose doesn't smell nearly as much as kerosene. Plus you can open the window in the crank and squirt it right into the motor. An interesting side note, with Fai fuel there is no Nitro. We usually don't use after run oil. If you disassemble one a week or even a month after the last one you don't find Rust. Completely coated with Castor on the inside. The only difference is the Nitro. You hear rumors about the alcohol evaporating out and leaving moisture if that was the case why don't the FAI Motors rust like quarter midget and quickie Motors?

kane » Fri Nov 11, 2016 11:30 am

rocket wrote:
... An interesting side note, with Fai fuel there is no Nitro. We usually don't use after run oil. If you disassemble one a week or even a month after the last one you don't find Rust. Completely coated with Castor on the inside. The only difference is the Nitro. You hear rumors about the alcohol evaporating out and leaving moisture if that was the case why don't the FAI Motors rust like quarter midget and quickie Motors.

Our fuel has more than just Nitro... Some have color added, some have a mixture of synthetic oil and castor, as well as some other additives. What causes the rust? Not sure, but there is something that keeps it inside motor and absorbs it.
DK

Top

Wondo » Sun Nov 13, 2016 9:26 pm
One of the byproducts of burnt nitromethane is nitric acid. Have you ever noticed after a flying session your hands seem to be dry and chapped. This is the spent fuel and oil etching your skin.
This may explain why the FAI aircraft engines that burn methanol do not rust.

Top

diggs_74 » Mon Nov 14, 2016 8:45 am
Methanol is hygroscopic, meaning it absorbs water.. Once the methanol evaporates, all that's left is water.. It will pull water right out of the air.. As is mentioned above, the byproducts left over from the burnt nitro probably aids greatly in the steel parts rusting.. However, for rust to form , you need a low nobility metal (steel, the contact with aluminum aids in corrosion also "galvanic"), an electrolytic path (the water and particulates pulled from the air by the hygroscopic action of the methanol and/or the byproducts from combustion), and oxygen.. Remove just one of those ingredients and no more rust..
Lee LaValley
NMPR# 33w
www.ncplracing.org

splatt » Mon Nov 14, 2016 9:03 am
Speaking of low nobility , how you doin, Lee? I wonder if the brass cone used at the front of the crank contributes to that corrosion in the croak of the crank, hence the need of a anti corrosion crank croak process to keep the front of the crank connected to the croak. On man, is it Friday yet? My process is full disassembly and wiping the crud from the croak and reassembly with power steering fluid as my preservation lubricate.

rocket » Mon Nov 14, 2016 9:39 am
Dumb question but, the case is full of raw fuel not burnt fuel. How would the Nitro conversion to acid affect if it never sees it.

diggs_74 » Mon Nov 14, 2016 10:26 am
Doing good Jess.. Actually, the Aluminum case the steel bearings are mounted in would be enough.. I hadn't considered the brass cone.. Got Q-40 on paper but haven't started the hard part yet.. want to get the new quickie done first since all I have left is a fuse mold..

I guess I was just throwing out the nitric acid based on the comment above, if it's in there, it would/could contribute to corrosion over FAI fuel.. Personally, I thing it's the methanol sucking up water more than anything.. But hell, it's a guess at best

rocket » Thu Nov 17, 2016 11:04 am
Another cool trick, the brass gasket is often the cause of leaking between the pipe and case. A little annealing will take care of that. Let them cool naturally. Softer metal seals better.


.

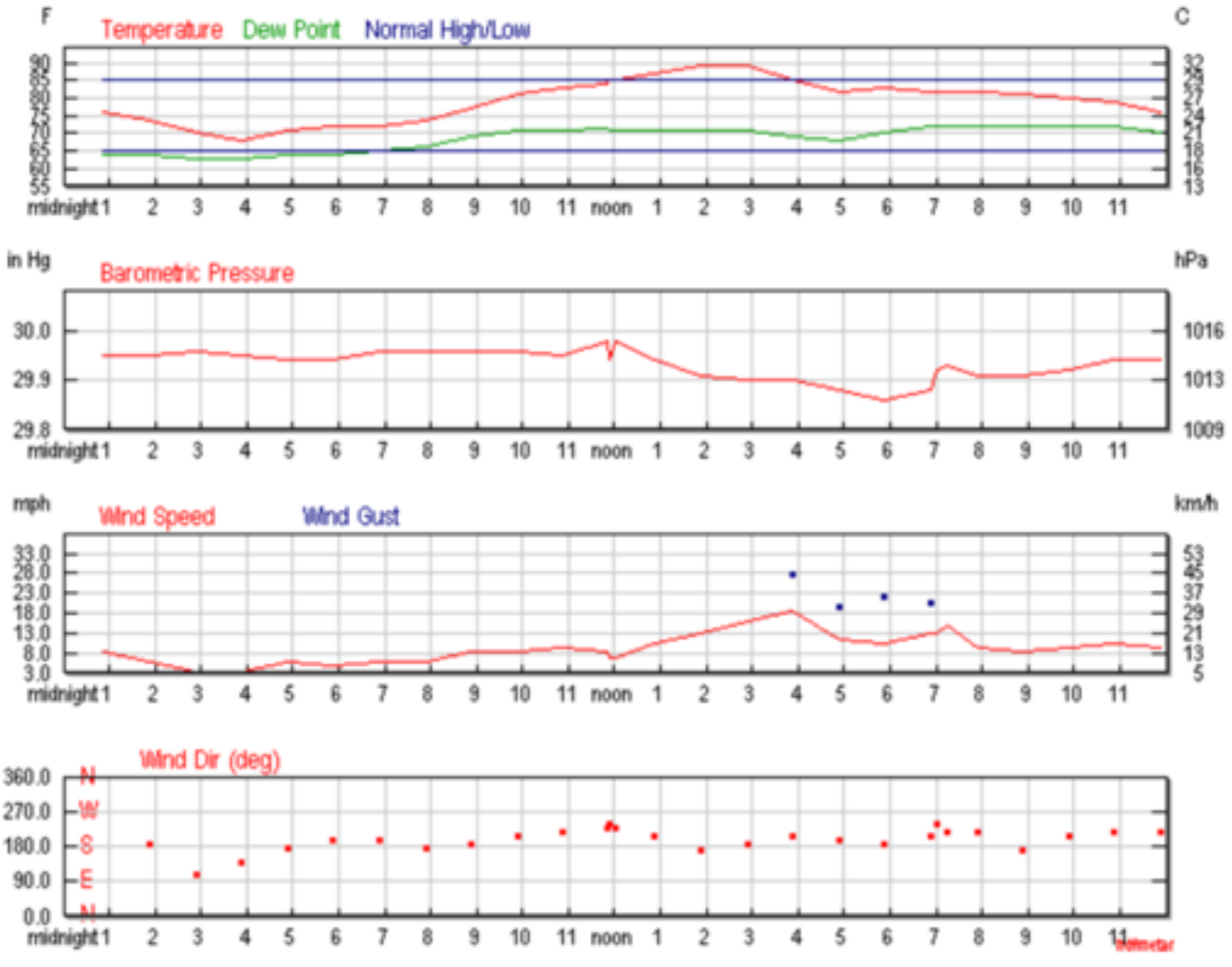
Dave N » Fri Nov 18, 2016 11:14 am
Damn, how did I ever go fast without all this info Great thread..

No wonder I was never as fast as Rocket.
www.ncplracing.org

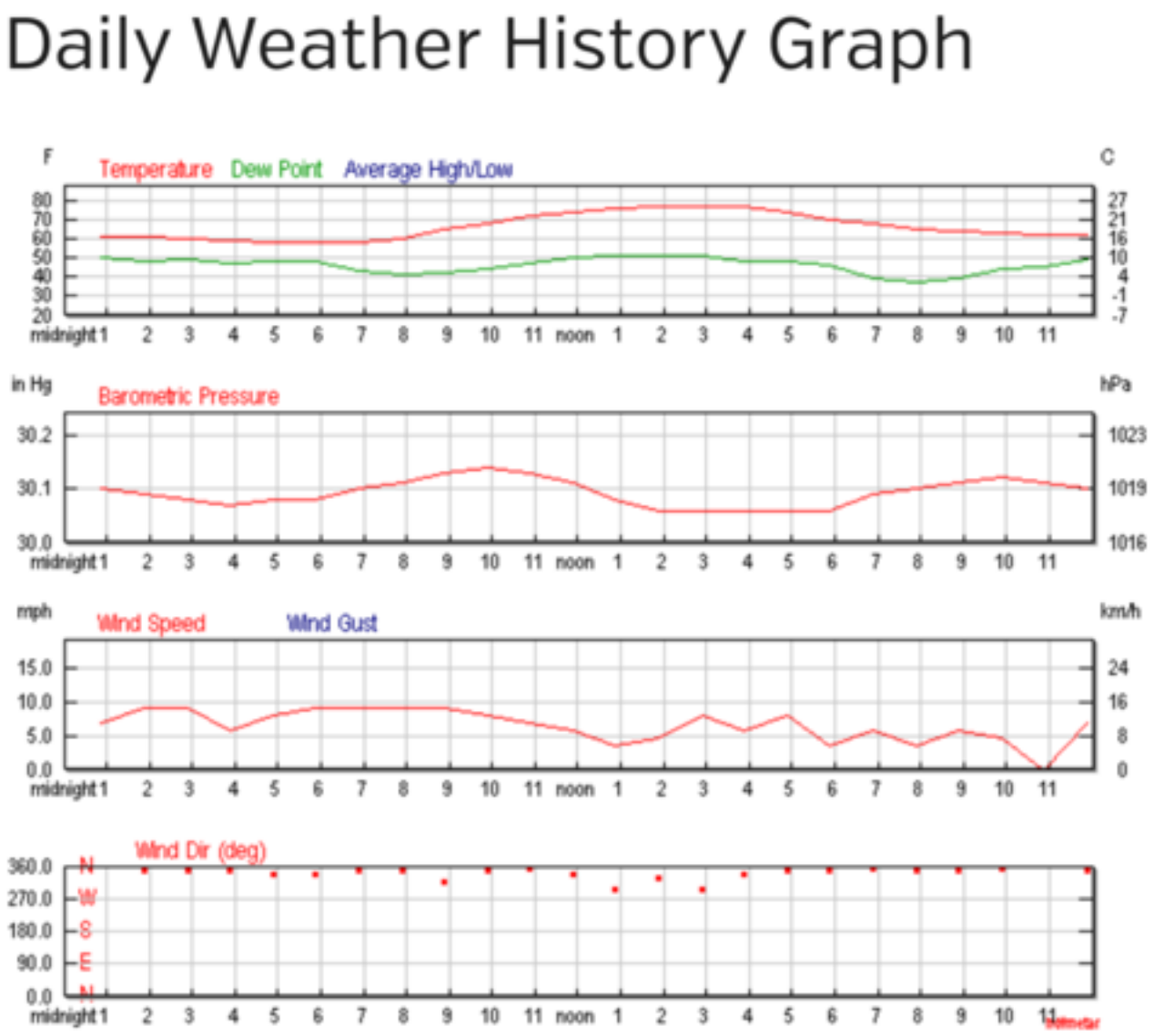
rocket » Tue Nov 22, 2016 7:26 pm
Plugs and mother nature.

The plane I flew at the Nats has been on the shelf since we got back. No changes, never even removed the prop. Took it to Markham on Monday afternoon to get a couple flights. It needled the same as I remember "this motor don't like to leave with no pinch, this is a discussion for another time". Radio in takeoff mode I let her fly. 10 pretty hard laps but didn't seem like it was unloading like before. An uneventful landing and back to the pavilion. Pulled the plug and I'll be dammm its crunched.

Here is where the mother nature part comes into play. WHY did it crunch the plug. This plug went fast in muncie but one flight in ft liquordale and it's Frazer on a six pack. Well let's visit the weather in muncie in july.



The barometric pressure for most of the day was 29.9. The motor was at 188/18. The prop was 7.6. The plug went the whole event, except for my first heat where I found the new plug I put for the first was a dud and I got a zer0. Fast forward to Markham and the crunched plug. Here's the same graph for the atmosphere on monday.



The

The flight was around 3:30. The pressure in muncie was 1015 mbars, Markham was 1017 mbars. If muncie was a base line and motors were adjusted to suit the air on that day then the pressure at Markham would indicate the head needed to be raised. I did, I raised it . 002 and no more crunched plug and it unloaded hard. So, the lesson here is pressure up, head up, pressure down head down.

gsjames » Tue Nov 22, 2016 7:42 pm
Rocket: Are the barometric pressures you showed the "local" pressure altitude or are they the sea level pressure? Ft Lauderdale is at sea level and Muncie is at 932' thus the same

"altimeter setting" at Muncie and at Ft Lauderdale would have very different actual pressures at the field. But of course the "pressure up, head up and pressure down, head down" makes perfect sense because you have more or less dense air to start with. Thanks!

rocket » Tue Nov 22, 2016 8:47 pm
The altitude is important when you get real high. From sea level to 1000' not so much. No real experience above 1000' so someone else will have to chime in.

DaveG » Wed Nov 23, 2016 3:49 pm
Would be interesting to see the numbers from the Denver race.

Where did you get the graphs Ray ?

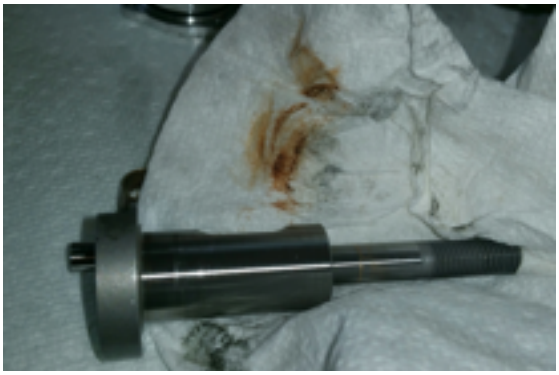
rocket » Wed Nov 23, 2016 4:47 pm
weather underground Dave. there's humidity there also.
https://www.wunderground.com/history/ai ... reqdb.wmo=
Here's a link, you can change it as needed.

rocket » Mon Dec 05, 2016 2:06 pm
The tangerine is in the books, great time, great friends, great racing as usual. Randy and I made a good team lol I think we're starting to think alike too. To bad for him haha. Anywho, here's the breakdown of the blue too sweets rebuilt motor.

This motor threw a rod at Julian two races ago. I gave the case to Mike and asked for new bearings and a rod. Mike couldn't get the rear bearing out so I ended up with a new case with bearings. The old case sat in my shop, I got bored with nothing to work on so I ordered a venturi, fai spray bar, crank sans glue a backplate and screws. The rest of the parts I had already. The liner is no shims with an 8, 5 and 3 under the head. 189 and 19 is the set-up. The head had been peppered so I cleaned the inner bowls with mother's and the squish band with 1500 on a glass top. Thus pic is fresh off the motor.

next I removed the crank. In the discussion about after run oil, this is the look of a well saturated motor.

This is the rust I wiped off the crank at the front where the bearing rides.



This crank has been in there for a month, after run must not make it this far north so I'm trying a little something with o-ring silicone. Well see after the next disassembly if it helps keep raw fuel from causing rust

rocket » Mon Dec 05, 2016 2:14 pm
The o-ring silicone is from a Jett tanker rebuild kit. The thinking is it will take the place of fuel between the bearing and crank, thereby reducing the rust. It's fuel proof.

next is the piston, again out of the same motor that threw the rod. You can see the marks from being forced out of the liner.

finished the top of the piston with 2000 on the glass top. Here you can see the damage to the inside of the case, it still has the original bearing mike couldn't get out.

rocket » Mon Dec 05, 2016 2:41 pm
Now on to the degree wheel.

This part will throw the "using liner shim by the numbers" and motor measurements right under the bus. I.e. why does this motor run good but this other motor "set up identically" runs completely different. Well let's start by matching the exhaust port timing and see what happens. As mentioned before not all liners are crated equal. Not knowing what the degrees of exhaust timing is, is like pissing in the wind and, if you piss long enough you might find a combo that works for "that" motor. First, get a timing wheel.

You can tell this wheel has been in use especially for FAI. Buy one with the small hole, I think it's 1/4 inch but I'm prolly wrong. Either way, this one is 5/8 hole. It fits the 15mm FAI stuff better. Just tap the small hole to fit the 5/16 crank. Affix the wheel using a prop and prop nut. Finger tight is ok. Using a head bolt, a nut that the head bolt goes through wrap a piece of wire around the bolt and tighten down.

now, looking at the exhaust port on an angel like the pic move the piston until that little light gap disappears.

Next, making very sure the top of the piston has just caused that light gap to dissappear make sure it don't move, position the indicator wire on 0. adjust the wheel to accommodate the wire, or vice versa. it doesn't have to be straight up and down.

Once your convinced the light is gone, the wire is at 0, rotate the crank the opposite direction NOT UP but down the way around until the light gap disappears again. Look at the indicator, this is your degrees of exhaust timing

in the case of the blue too sweet it's 197 degrees with no cylinder shims. If you rotate 180 degrees from 0 to 0 then add the 17 hash marks you get 197.

Now, and only now can you match one motors exhaust timing to another motor.

Blue two sweet fits.

The piston dry fit is .245 extremely loose. 6 Prop.

Two exhaust gaskets!

rocket » Mon Dec 05, 2016 3:16 pm
Exhaust timing and shims.

Once you measure your motor, a mathematical certainty, every 1 degrees of exhaust timing is. 003 shim. If your best running motor is set up at 195 and 19. Pull the shims and measure it. "If" it measured 197 degrees with no shims and your TDC was 189 like the blue too sweet when you put .006 under your liner to get to 195 .006 is 2 degrees of exhaust timing, so, your exhaust timing would be 199. if your other motor set up at 195 and 19 has a different exhaust timing say 201 degrees then you would need to come down 2 degrees or .006
And I said, here am I send me.

rocket » Mon Dec 05, 2016 4:40 pm
The reason I used the blue too sweets motor was to show the setup it was running. Also to show another trash can motor that went real well. The setup is mixed in the thread. To answer the messages its..

.245 dry fit piston depth. You will need to have a piston fitted to achieve this.
The exhaust timing is 197 degrees.

So, to match the setup, 197 exhaust and .020 clearance what ever shims you need to get that setup.
And I said, here am I send me.

rocket » Mon Dec 05, 2016 6:50 pm
Another answer, yes lots of motors run higher timing. I don't know what their exact numbers are only what I've heard. If you measure your motor with out shims and you know what your base exhaust timing is when you hear a conversation about motor setups you can do some simple math in your head based on the 1 degree of timing per .003 of shims.

The biggest variable is case, cylinder and crank stroke. there can be as much as a degree or more in just the crank throw but usually less than that. This is based on .789 throw which is what mike shoots for.

KRProton » Wed Dec 07, 2016 8:44 am
Cool stuff Ray.

Nothing to contribute, just letting you know I'm paying attention and thanks!

Tim

DHULEN » Wed Dec 07, 2016 12:53 pm
I agree this has been great

rocket » Sat Dec 10, 2016 3:30 pm
Thanks Tim and dwyane. I really enjoy the cudos.
A better way..

While playing with the motor with holes in the case I found a new and improved way to measure exhaust timing. I've been doing FAI motors so long it was second nature to do it from the front. Turning the wheel around makes it tons easier for side exhaust. That being said let's check the numbers.

This motor is the CA to fill the cracks motor from the thread that almost got Tim a new Nelson :-)

The same setup with no liner shims it's exhaust timing is 198. That's .003 different from the motor before which was 197. The BDC measurement was 980, less the stroke of 791 gives a TDC of 189.

To match the exhaust timing of 197 on the motor a few post before this is not possible, we can't go down only up. I would need to add a .003. To the 197 motor to get it to 198. This would mean one motor is at 189 and one at 191 to get them the same.
Last edited by rocket on Sat Dec 10, 2016 3:37 pm, edited 1 time in total.

fizzwater2 » Sat Dec 10, 2016 3:35 pm
wouldn't adding a .003 shim take you from 198 to 199 on the timing? You'd have to lower the port to reduce the exhaust duration.

rocket » Sat Dec 10, 2016 3:38 pm
Yeah, I just changed it. A customer was talking to me while I was typing.

DaveG » Sat Dec 10, 2016 9:23 pm
Ray is a Multi Tasker
Great thread Ray

rocket » Sun Dec 11, 2016 3:06 pm
What I meant by "we can't go down only up" was these motors have liner shims. So in my case it's as low as it will go now so only up with liner shims.
And I said, here am I send me.

BernieV » Sat Dec 17, 2016 6:27 pm
Rocket,
I really do appreciate all the information and pictures you have posted on Q40 motors.
Thanks for all the effort!!
Bernie Vanderleest

RobertV » Sat Dec 17, 2016 6:50 pm
This kind of information exchange is exactly what NMPRA and this forum should be about.
Great work, Rocket Ray!
Robert Vess
Raleigh, N

vonderhey » Mon Jan 09, 2017 5:59 am
Hmmmm. I wonder if port alignment could affect the performance of the engine as much as the timing change does. Just maybe having the ports aligned as good as they can get along with the fit & seal location in its ultimate location could be a good formula for creating consistent and fast engines. Hint... Von Der Hey.

Dave N » Mon Jan 09, 2017 4:37 pm
Lee,

I always wondered why the sleeves were not pinned or notched in some way to assure the sleeve doesn't twist while tighening the head down. I suppose it would be pretty easy to do some tests with the port perfectly centered, or off slightly forward or back to see if there are differences..
www.ncplracing.org

vonderhey » Tue Jan 10, 2017 11:02 am
It's the height of the sleeve ports in relationship with the ports on the case that need to be properly aligned. If you raise the sleeve to .203 it doesn't do much good if you can't raise the exhaust manifold port in the case. Likewise with the intake and transfer ports. This sounds simple but there is quite a bit of back and forth measuring and adjusting because of the fit to seal relationship needing to be at the right location. This might be why some engines run very good at .191 and some run good at .196. Having a sized selection of pistons on hand is a must. Von Der Hey.

Mike Del Ponte » Sat Jan 21, 2017 1:19 pm
KURT, KURT, KURT

KRProton » Sat Jan 21, 2017 4:44 pm
vonderhey wrote:
It's the height of the sleeve ports in relationship with the ports on the case that need to be properly aligned. If you raise the sleeve to .203 it doesn't do much good if you can't raise the exhaust manifold port in the case. Likewise with the intake and transfer ports. This sounds simple but there is quite a bit of back and forth measuring and adjusting because of the fit to seal relationship needing to be at the right location. This might be why some engines run very good at .191 and some run good at .196. Having a sized selection of pistons on hand is a must. Von Der Hey.

Are you saying Lee that the objective isn't to tinker with the timing, but to optimize the timing by aligning the ports in the sleeve with the ports in the case
Then, once you've achieved that, you need a piston to match so it has the proper "pinch" at the location of the sleeve, yes?

vonderhey » Sun Jan 22, 2017 12:08 am
Yes, this is what works for me.

rocket » Tue Feb 21, 2017 1:26 pm

vonderhey wrote:

Hmmmm. I wonder if port alignment could affect the performance of the engine as much as the timing change does. Just maybe having the ports aligned as good as they can get along with the fit & seal location in its ultimate location could be a good formula for creating consistent and fast engines. Hint... Von Der Hey.

so, ive looked at this from all angles now. theres about a mm of travel for the cylinder from head bolt center l to r without boring the holes in the cylinder or trimming off the threads of the head bolts.. things that make you say hmmm. is it a measurable change? im sure. even the mm of travel you could see better alignment. cool tip.

And I said, here am I send me.

rocket » Sat Feb 25, 2017 6:41 pm

At the classic, the blue too sweet is dead... the motor that dominated this thread, cracked case, broken rod, used liner, piston, refurbished diehard is going back on the bench for life 4 of 9.

Kurt Bozarth » Sat Feb 25, 2017 7:33 pm

Somewhat ironic that I was flying with Rocket when it went in.

rocket » Sat Feb 25, 2017 9:38 pm

Kurt Bozarth wrote:

Somewhat ironic that I was flying with Rocket when it went in.

Wow, yes it is. We have come full circle. Even more ironic that I'm reading this and your eating on the other side of the restaurant. 

DHULEN » Sat Feb 25, 2017 11:39 pm
It was hauling ass.

KRProton » Fri Mar 03, 2017 2:18 pm
I'm just beginning to understand how to needle a Q40 engine at the line for optiumum performance during the race. My first Q40 race in Wichita (Too Sweet/Nelson engine) Duane Hulen and Mike Deneve did the needlign and changed my diaper for me. But now I'm a big boy, so I needled my own engines at the Q40 classic (under the tutelage of my caller Trey Whitte).

Let me just throw this out there and see what comes back…

Before the racing on Sunday, Trey suggested we go to the airplane stands behind the pits and find peak rpm on our engines (Nelsons that day). Kurt Bozarth looked to be doing the same, so I peaked over his shoulder to see 25,300rpm on his tach! (Kurt, I hope you don't mind me discolsing this information – better to ask forgiveness than to ask permission.)

Zoiks! I've never had my Nelson up that high. But sure enough, I got exactly the same reading on my engine – 25,300rpm. Cool!

So what am I to do with that? The figures floating around the pits are to set your engine on the line 1,000 – 1,200rpm below peak depending upon who you talk to.

So, is this procedure of determining peak rpm in the pits before the race to be used as a base for setting the on the line? Then, I would get to the line, set my engine to about 24,300, launch and race, then read the plug and go from there?

Or, is that peak rpm on the stand only confirmation that your engine is where you want it to be and you re peak it on the line and back off the aforementioned 1,000 – 1,200rpm from there?

Or, either is okay depending on your preference?

I understand conditions may change as the day progresses, so the method of finding peak on the line (then backing it off) may be preferred. My problem with that is, right now I'm too tentative to find peak before the clock runs out. Maybe as I practice that I'll become more efficient.

I know, I know. Can-of-worms here. 

KRProton » Fri Mar 03, 2017 3:38 pm

delateurj wrote:

I tend to not peak on the line, I am more of set based on last needle and lean out a little if plug looks I can and not sure what it peaked at last time I bench run.....so can't really say what peak on the ground.

That initial peak on startup is not me peaking. This engine has a tendency to want to jump on the pipe hard right at the start even a half or 3/4 of needle open from my set point. I use thumb partially over venturi to quickly get it a little rich until it warms up and then position set, so bottom line, wouldn't read much into anything before launch.

I am using the Spektrum backplate sensor which is a hall effect sensor that detects crank pin. Zap a dap goo'd into the backplate.

In regard to my previous post/question, this is more along the lines of my preference for the time being. "Position" set the needle (where it was last flight) plus or minus a little depending upon what the plug looked like last flight. Mike Helsel also mentioned this to me as an option (when consulting him about my Jett engine).

Tim

Kurt Bozarth » Fri Mar 03, 2017 9:03 pm

Hey Tim,

Here are my only two cents worth:

$0.01: I don't think anyone needles to peak on the line and then backs it off.

$0.02: Motor set-up and airplane (tank height) can dictate how much to be off of peak on the line. Different set-ups unload differently.

Kurt

splatt » Fri Mar 03, 2017 9:09 pm
Hello all,

I get to turn words into instructions and get paid to do it, Pays the bills. So taking all the wisdom from Mr. Browns words, I present something I need show here. What I am missing, for me, are alternate ways to choke an engine other than asking someone to stick their finger in harms way. Is there a butt plug method that could be used? Here it is.

Problem: The jump on the pipe is the result of no tank pressure at start up.

Goal: Having a pre-set needle setting,then being able to choke the engine after start-up until a couple seconds before the flag, maintaining a true needle setting for flight.

Avoid: starting and let it run on the pipe for the 45 seconds, allowing the engine to heat up. The thought is that once the engine is overheated it will not cool down on its own.

Optional: To test where your needle setting is compared to this method, after you have flown while needling and letting the motor heat up, on your next flight, leave the needle in the same position, start it choked, keep it choked for 30 or 40 seconds pull your finger off the venturi and push it. It will fly rich all 10 laps.

To find the right needle setting for this type of start. After you have done the type of flight mentioned above, on your next start, with the needle the same, choke it, let it run 30 or 40 seconds to simulate a heat. When you pull your finger off it should be running rich. Don't fly it yet.

Turn the needle in until it hits the pipe and shut it off. After it cools fly it again. Go through the start sequence again. This time when you pull your finger off, after 30, 40 seconds, it should hit the pipe hard. It's important that only a couple seconds are left on the clock before you pull your finger off and push. Don't let it sit there and run. Now your first lap is on the pipe and running. The engine never gets a chance to heat up and if everything is good it should run all 10 laps hard.

I need to practice what I preach here and learn what that" hard "RPM is. Now onto the magic spot in a liner.

Wha?

KRProton » Fri Mar 03, 2017 10:07 pm
Kurt Bozarth wrote:
Hey Tim,

Here are my only two cents worth:

$0.01: I don't think anyone needles to peak on the line and then backs it off.

$0.02: Motor set-up and airplane (tank height) can dictate how much to be off of peak on the line. Different set-ups unload differently.

Kurt

Thanks Kurt!

Now that's something I can work with...

Yes, peaking on the line, then backing it down doesn't sound right to me either. I was probably misunderstanding something there.

So then, to your point no. 2 (determining how far below peak to launch), you need to know how the engine behaves in your plane and read the plug after a flight to determine where to set it for launch.

And apparently, the procedure of peaking the engine on a test stand on location before the race lets you know the peak rpm at that point in time. Given that, and your prior knowledge of how far below peak to launch, you will know where to launch that day.

Sounds like one of the first things you do before you fly is to peak the engine on the ground to see where peak is then and there.

In my case, my Nelson in my Sweet Vee that Sunday morning peaked at 25,300 rpm. I'm running a Jett oval tank as high as it will go, so the plane **does not** have a tendency to lean as the flight progresses - it seems to remain pretty much consistent through the 10 laps. We were launching it at around 24,300 and even "eeked" it up from there a bit. As the heats progressed the plane seemed fast (after my last race with Danny Coe he said "man, you got some speed!") and the plug looked good, so I'm there - I guess.

Given the above, for practice I might launch about 1000rpm below peak, read the plug and go from there. I can get into shimming later once I have a better understanding of a good launch rpm.

airraptor » Fri Mar 03, 2017 11:32 pm

I am new to this racing, well new compared to must in here. One thing is almost everyone will help you. This past Phoenix classic was my third time and the biggest thing that has helped my times on the course wasn't the best engine prop or so forth. It was flying the course as best you can. You can take any of these guys like Ray, Lee, Travis, Dan and many others and give them an early polecat with a old SS engine and they will still turn a 61 or 62 on the course.
Like I said I am still learning and with the two planes I fly the Strega and the Dago. Both of these I have the needle one turn open from last run adjusted if needed depending on the plug. Then when race time I prime at 50 seconds, start engine by 42-45 seconds, and once its running I close needle half turn and pull glow igniter. At the 35-30 second mark I tune to peak (clear smoke) then richen until smoke reappears and then continue to rich till a very slight rpm drop. This works for at this time but one day I will work toward the leave needle alone and choke carb idea. But that is down the road for me now its engine starts every time and pipes up for the race. flying the course has improved my times the most.

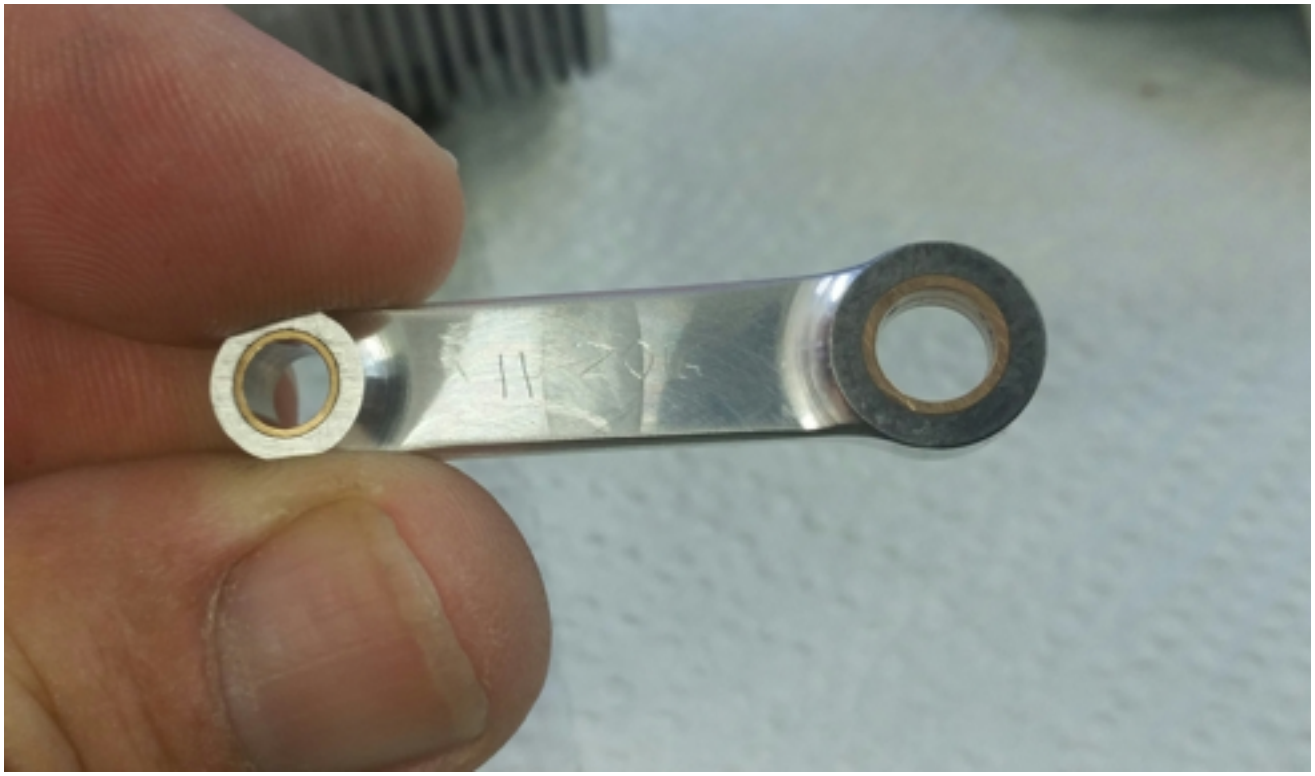
As far as the engine goes my thoughts are what ever you do stay with the same methods of measuring, shimming and tuning, changing methods will just keep you chasing issues IMO. As far as telemetry goes I have seen up to 29,300 in the air on a 7.6 prop. This was on a sweet V built by Richard so I know the firewall was correct and all. With timing my number one engine liked .008 under the liner and .012 under the head on hot days with low density air. On the colder and high density days it liked .006-.007 under liner and .009-.010 under the head. Now with that I changed out the whole top end on that engine set up with same numbers and didn't run as strong as it did before. So like Ray and Lee said piston fit and liner alignment are important.
All of this is my opinion so good or bad its what works for me so far but in racing you are always learning. Oh one thing I learned with normal sport engines when messing with timing and all with them is if oil was dark it had to much compression or overloaded with prop. Thoughts?

Top

rocket » Mon Mar 06, 2017 7:16 am

I received my boxes back from Phoenix. Had the opportunity on Sunday to clean up the motor from the blue too sweet which crashed around pylon 3. Basically the old case with the cracks from the broken connecting rods has seen its last match. Rather than bore you with the rebuild I'll just show you a couple cool tips, and the finished product. The first picture is a relief hole for a crack on the web. I think the crash in Phoenix caused the crack to move into a case so it was time for a new case.

Also, scribing the date on to your connecting rod is a sure way of knowing exactly how old it is not necessarily how many flights it has unless you log your flights. This was the connecting rod from the crashed too sweet. It's thought that a crash like that where the motor comes to an abrupt stop will cause the connecting rod to fail if you use it again. So better safe than sorry.



New case, conrod, front bearing and she's ready for life number 4 of nine.

KRProton » Mon Mar 06, 2017 9:07 am

I got my stuff back from Phoenix too - came through perfectly intact! (Though my wood crate/box needs a little repair.)

Thanks for more tips Ray - and the images - always enjoy looking at Q40 engines!

Tim

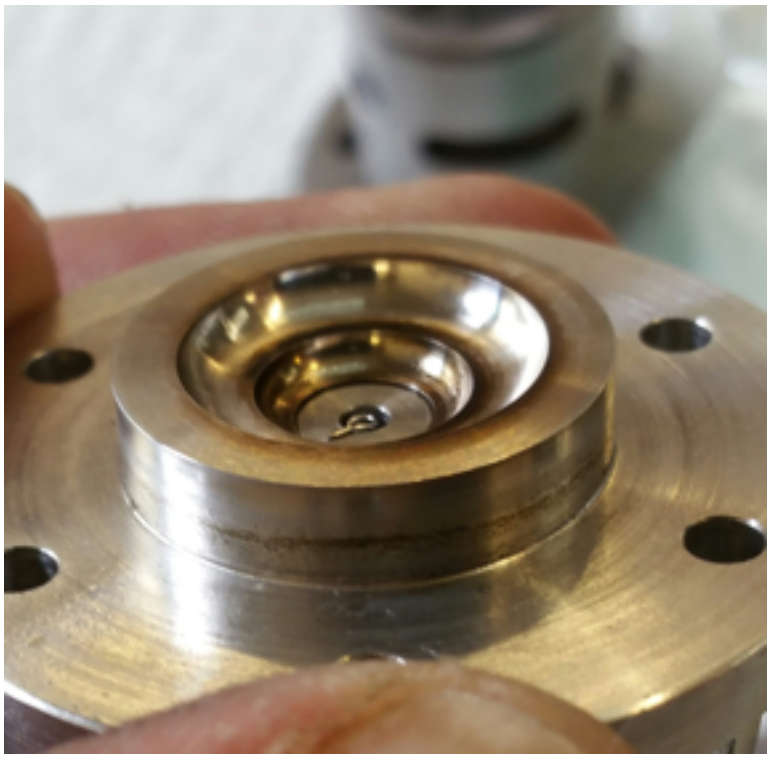
Last edited by KRProton on Mon Mar 06, 2017 3:24 pm, edited 1 time in total.

Top

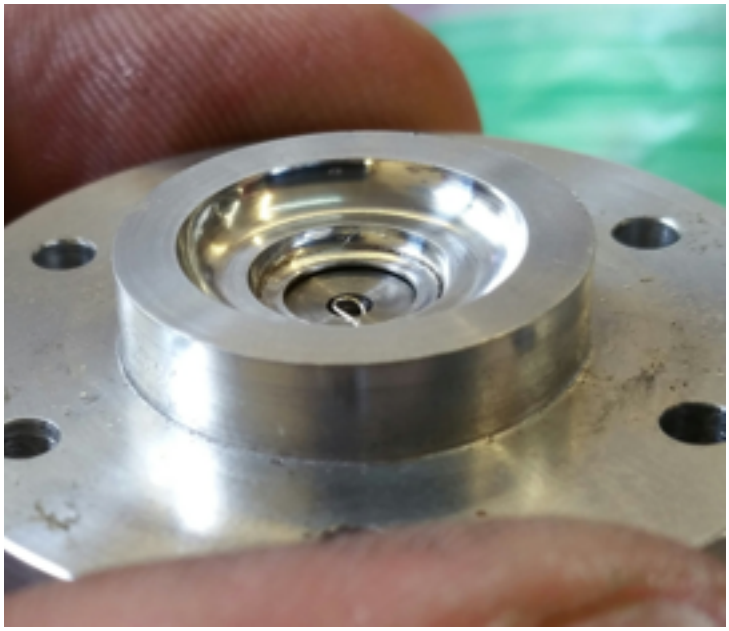
rocket » Mon Mar 06, 2017 3:13 pm

Gorilla grip, glow plugs and last place.

It seems lots of folks enjoy reading the latest and greatest thread. It also has caused yours truly to take on the job of impromptu engine checker. Being the eternal tinkerer I said sure, I'll have a look, it will give me something to do lol. Anywho, after disassembly and a thorough looking at. I thought what I found worthy of a pic n post.
The gorilla grip glow plug install will cause the smaller of the two bowls to deform. Prolly leak and is definitely detrimental to the horsepower.the first two pics are healthy heads with the proper shape in the bowls.



You can see in the next two pics of a gorgilla gripped glow plug install & deformed bowl



Just snugem enough where you can spray your favorite cleaner on the head, turn the prop to TDC and check for bubbles. Anything more than that is unnecessary.
And I said, here am I send me.

Top

rocket » Sun Mar 12, 2017 11:08 am
Someone was listening.

A transcript from an email thread between mario, Dan and myself.

Hey Ray, Mario and I were perplexed following our Phoenix racing! We used your technique using the degree wheel and I believe we've found the answer why Mario's engine was a Missile and mine was so cranky when both were setup at .194/18

This is what we found using the degree wheel, let me know if what we found is correct?

My motor was setup at .194/18 using my depth mic setup, degree wheel showed .201° of ex-timing and .184 from the top. (Bare) So with the .010 shims added to get me to .194 that put my ex-timing at 204.5°.

We degree'd Mario's Missile Motor and saw these numbers, .197 Ex-timing and .187 from the top. So putting .006 under the sleeve takes him to .193 with ex-timing at 199°!
So in conclusion my motor had very high ex timing as compared to Mario's with both engines setup at .194/18!

So to get my motor as close to Mario's I'd need to remove all shims to get 201° lowest I can go with his motor shim'd to 199°!

But my ex timing would still be 3° more open than his!
This would explain why it was so tough to keep in the pipe on Sunday!
Is this finding correct!

Thanks Ray!

Dan Thordarson

Ray,

Thanks for sharing your tips on the forum.
Dan and I are just trying to duplicate good engines' settings as much as they are "duplicable" to our other engines.

We'd really appreciate your input!

Thanks bud!

Mario Salazar

That's exactly right. Setting the motors with a depth micrometer and shims means nothing if your trying to set two motors the same. 200° of exhaust timing is where Henry designed it to run. 200 or less is favored. RR
And I said, here am I send me.

Top

KRProton » Wed Mar 22, 2017 3:38 pm
Some pages back there was discussion about using a ring on the back of the firewall for securing the engine mount bolts rather than using blind nuts. I didn't even know it, but the other day I was on the Jett web site and happened across a reinforcing ring made by Jett for his engine mount (and apparently, most other ring-type mounts) – this is ready made for those who use the Jett mounts. The ring is listed at the bottom of the price chart about halfway down the page:

https://www.dubjett.com/accy2015.html

Wish I would have known about this before!

Tim

Top

rocket » Wed Mar 22, 2017 6:54 pm
Lol, you did. You just read too fast. Mike langolis has them as well. The bolt pattern is the same.

KRProton » Wed Mar 22, 2017 9:47 pm
Don't know how I missed those mount rings Ray. I thought I made some kind of discovery everybody else had missed!

Tim

Top

rocket » Thu Mar 23, 2017 8:37 pm
I think it's in your too sweet build thread too.
And I said, here am I send me.

Top

KRProton » Thu Mar 23, 2017 9:05 pm
Well,

I do remember several mentions and an image or two of a ring, but I thought the rings I saw were homemade from aluminum engine mounts with the beams cut off, not the manufactured Jett ring.

Huh.

Tim

splatt » Sun Apr 30, 2017 4:28 pm
Someone let this thread fall to page two, so much information here. I decided to take little bits and pieces of what I learned here to help me find where my ideas of engine operation play out. And since the weather is crap, its time to bench race

I am going to put a new top end in a small flange and figured I would test my contraption on a known quantity of engine build first to see if I can correctly record what a good engine set up is.

A maximum of 200 degrees and no more of exhaust duration is said to be a target. OK. I have an engine that I want to see before I have a chance to wreck it. Using nothing more than normal household items, items found on my workbench and the power of the Internet. I can check my own exhaust duration and see for myself

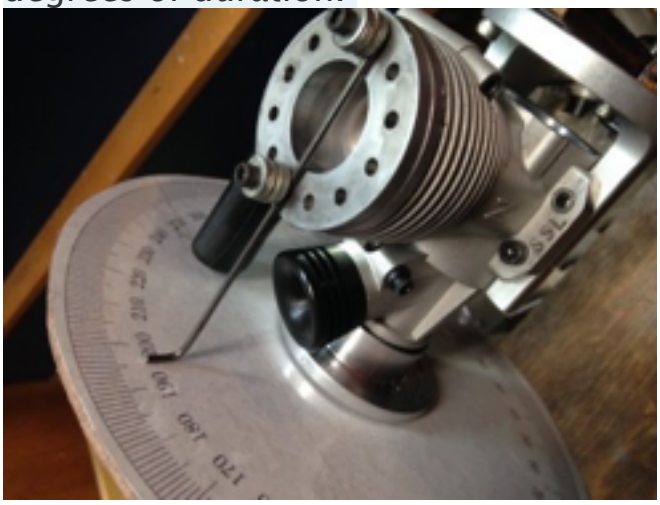
Me and my friend attached a motor mount to an old wood assembly stand. Then I googled degree wheel and hit the images link and looked at several images of degree wheels. I decided to use one with 360 degrees marked out because of the goal needed, a total count of degrees.

Once I found one I liked, with MS Windows, I click Start and type snip and open the MS Snipping tool and save an image of it. Save it. Print it. Cut it out, Safety moment. Don't hurt yourself

I used a some thin paneling board and used Contact 77 adhesive to apply it. Cut it out with a scroll saw and then covered it with clear packing tape. Drill a hole. Slap it on. Put the prop on front of it and tighten the nut, just enough to it snug so you can zero out your wheel with your finger tips.

I used a clip on LED light for a music stand and aimed it into the port. I can hold this whole contraption in my lap and leave both hands free to fiddle with. Then I zero out the wheel at the point where the light from the LED just disspeared when looking at the port from the inside, referencing the powerful image below from Mr. R. I used a stack of tiny washers and an allen wrench to fashion my pointer

Then its just a matter of spinning the wheel around till the light once again just disappears. Here is what it looks like with no shims under the sleeve. 195.5 -- 196 degrees of duration.



After placing the 2 shims back in, a 003 and 008, the timing comes out to be just a touch short of 200 degrees. Walking away and coming back to look again, I get 195.5 degrees of duration.

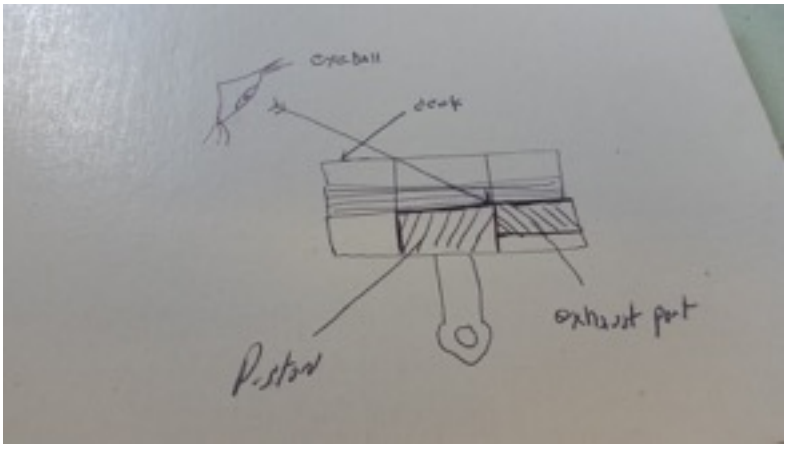
I will want to look my other engines as time goes by and will be interested in any comments on duration. When to change, when to leave alone. Humid , dry, ocean or mountain tops.

Last edited by splatt on Sun Apr 30, 2017 8:24 pm, edited 4 times in total.

Top

rocket » Sun Apr 30, 2017 5:03 pm

Just a reminder "cause I didn't read where you mentioned this" you need to be looking at the lowest possible angle to get the most accurate reading. Anything more than this diagram your seeing the taper of the piston top. Cool idea on printing your own degree wheel.



And I said, here am I send me.

Top

RSmith » Mon May 01, 2017 2:13 pm

If anyone is looking for a good quality degree wheel, Hank Kauffmann had some made out of FR4 circuit board material (fiberglass sheet) and had the 360 degree scale etched on to the board same as is done with printed circuits. He was selling them in Phoenix for about $10 or $15 I think. Center hole is 5/8" for Q40's and he might have some with a smaller hole for 426 – not sure. Contact Hank if you're interested.
Randy

http://sites.google.com/site/cppradistrict3

Top

rocket » Mon May 01, 2017 6:46 pm

This thing is too nice to use. If he's selling them, I would get one for your trophy case. Or, if you don't mind using a work of art to measure your motor with then by all means.

rocket » Mon May 01, 2017 7:11 pm
airraptor wrote:
Now with that I changed out the whole top end on that engine set up with same numbers and didn't run as strong as it did before. Thoughts?

Re visit the liner. If you read back through you'll find where it says to just change the piston and rod of a good running motor that has worn out its piston fit. "Credit-Dub jett many moons ago" The liner was in whole the the secrete to that motors performance. Try using the new piston from the new drop in. Measure where it "bites" if it fits, run it in the old liner. No need to regenerate the surface of the liner. A little breakin as per this thread and You will be pleasantly surprised. If the fit is not acceptable have the manufacturer fit a piston to your liking.
RR

airplanescotty » Thu May 04, 2017 7:59 am
Being an Ole' Information Technology guy, I was wondering if there is a capability to Download this "Wealth of Information", so a guy could print and binder the Doc for reference while in other locations of the home

DonStegall » Thu May 04, 2017 6:50 pm
airplanescotty wrote:
Being an Ole' Information Technology guy, I was wondering if there is a capability to Download this "Wealth of Information", so a guy could print and binder the Doc for reference while in other locations of the home

I use this http://www.tensons.com/products/websiterippercopier/ to save things if saving to a page using Chrome will not get the job done.

If I can get permission to turn this thread into a document, I will grab it and save it in Word / PDF format to be shared.
Don Stegall

airplanescotty » Fri May 05, 2017 12:06 pm
Thanks Don,,,,

I just finished moving all this information to a document! Pictures, of course, included!

After I proof my work I will make it available to whom ever would like a copy