From: National Control Line Racing Association
Bill Bischoff 1809 Melody Ln.
Garland, TX 75042

TO

Chuck Barnes, Paul Gibeault, and Bill Bischoff mixing it up at the DMAA Fall Finale this past October 7-9.

SPECIAL MOUSE RACE EDITION

INSIDE:
District Reports
Contest results
Suppliers/Equipment
Updated Contest Calendar

Torque Roll Issue #129
December 2016

PRESIDENT- Bill Bischoff

Hi, everybody. Welcome to our super gala holiday mouse racing issue! I haven't seen it yet, but I'm sure it's going to be awesome. Thanks to all our wonderful contributors.

Facts and rumors...
First, the dates for the 2017 NATS are set. Control line will be the week of July 16-21. The weekend of July 22-23 is tentatively the F2C Team Trials. Dave McDonald has indicated a willingness to run them, but until a formal bid is approved by the team selection committee, consider this unofficial. The Nat's schedule I have proposed is Monday: AMA Goodyear and Sportsman Goodyear, Tuesday: Mouse and Quickie Rat, Wednesday: AMA Slow Rat and Super Slow Rat, Thursday: Clown and F2C. This leaves an open day Friday for the F2C teams to get prepared. Again, this is not official until AMA says so.

And speaking of contest schedules, The Dallas Model Aircraft Association is already making plans for next year. Based on the success of this year's Fall Finale (see my District report), next year we plan to add two more events and expand our April and October contests to three days of racing. The tentative schedule is **F2C** on Friday, Quickie Rat, Super Slow Rat, and Sportsman Goodyear on Saturday, and **AMA Goodyear**, Mouse, and Fox/Goldberg on Sunday. The exact dates look like they will be April 21-23 and October 6-8, but may change. The DMAA schedule will be firmed up by the next issue of Torque Roll.

Good news and bad news
The bad news is that the Magnum XSL15A, popular in Sportsman Goodyear, seems to have been discontinued. Tower Hobbies shows it as discontinued, and Hobby People no longer lists it all. Couple this with the long time unavailability of the ASP 15A from Hobbypartz, and suddenly there are no engines to be had. OK, ready for the good news? Just Engines in the UK has confirmed that the ASP is NOT discontinued, and they have them in stock. With the current monetary exchange rate, engines are about $50. Shipping is expensive though, so order several, OR (here comes the even better news) a deal has been arranged with MBS Model Supply to sell the engines less carb and muffler. You will be able to buy them as a "short" engine, or complete with CL venturi and needle assembly. I'm not sure when Melvin will actually have them in stock, but it shouldn't be too long.

NCLRA for Christmas
Why not sign your buddies up for NCLRA this Christmas? You'll look like a good guy, and they won't have to know it's **free!**

NORTHEAST - Phil Valente

South Jersey Aero modellers contest of 11-6-2016
CD: Phil Valente

SPORTSMAN CLOWN LAPS
7.5 minutes- not to exceed 140 laps

1.Dave Edwards.....140 (Perfect)
2. Tom Schaefer.....136
3, Al Ferraro.....122
4. Ernie Evon.....117
5. Larry Wilks.....112
6. Raul Diaz.....110
7. Phil Valente.....98

FOXBERG
100 LAPS-2 PITS

1. Dave Edwards.....6:55:56
2. Larry Wilks.....9:26:30

1 OZ GOODYEAR
100 laps-60' lines

1. Ernie Evon.....9:36:96
2. Raul Diaz.....11:08:56

PERKY SPEED

1. Tom Schaefer.....107 mph
2. Dave Edwards.....104

FOX 35 SPEED

1. Al Ferraro.....87:77 mph
2. Dave Edwards.....84:08

SOUTH CENTRAL - Bill Bischoff

Dallas Fall Finale 2016
This was one of the best contests I have ever been a part of. It had everything. Great weather-Check! Great turnout-Check! Great competition-Check! We had light winds and temperatures in the 70's. We had people from Texas, Kansas, Georgia, Charlie Johnson came in from California, and Paul Gibeault and Les Akre even came down from Alberta Canada! We had five events with five different winners. We literally finished up at sunset. It was a beautiful thing.

We ran the events in order of most to least demanding for the pilots. This, coupled with the mild weather, allowed the busy pilots to make it through the entire day. Quickie Rat was first, with six entries. Paul Gibeault was top qualifier, followed closely by Bill Lee and Les Akre. Since Les and Paul (the Les Paul team for you guitar players) were working together and both made the finals, Bill Bischoff

stepped in to fly for Les, and Mike Greb pitted for Paul. Les took the checkered flag with a 6:13.85

Super slow rat was next with six entries. The Les Paul team flew Bill Bischoff's spare model, powered by Les Akre's Brodak 25. In one heat, Bill Lee's airplane got together with the Barnes airplane. One ran out of fuel just as the other was taking off, and they both tried to occupy the same airspace. We all know how that works out! Bill Bischoff had a clean race to record a 5:14 for the win.

Tired of the same old meaningless awards? At the Dallas Fall Finale, rather than trophies or plaques, all contestants received a T-shirt. Paul Gibeault models for Charlie Johnson's camera.

Twelve contestants entered Sportsman Goodyear. Paul Gibeault borrowed an airplane and engine from Bill Bischoff, and showed his good manners by letting Bill beat him by a second. Charlie Johnson pitted for his former California cohort Allen Deveuve. Les Akre had a Norvel BigMig 15 powered Stinger that started well and was plenty fast. Unfortunately, Les had to pull out of the final when the Norvel's connecting rod galled on the crank pin. Mike Greb gave Bill Lee a good run for his money, but Bill prevailed with an excellent 8:13.

The four Fox/ Goldberg contestants elected to just fly the 140 lap finals. Patrick Hempel won with a sub-10 minute time. The Barnes entry hadn't made their last pitstop by the end of 140 laps, and had to make 18 extra laps. Otherwise, their time would have obviously been much better. Dale retired at his last pit stop, and Melvin was a no-start.

Mouse 1 had nine entries, and some close racing. Unfortunately, we had a bit of an incident in the final. I was flying for Melvin, and we were on the ground pitting. Paul was flying for Les, and came in for a pit. Even though Melvin's wingtip was down and the lines were on the ground, Paul snagged on our lines. As event director, my judgement was that no one was at fault, and I simply let the race continue. Reviewing the rules later, I found that Les and Melvin should have been given a refly. This was my mistake, and I apologize to Les and Melvin. I hope it didn't tarnish the overall experience for either of them.

Charlie Johnson (rent a pilot), with Allen Deveuve and his "Polecat" Sport Goodyear entry.

Thanks to all the DMAA members who helped time and count laps. We had enough personnel to have two timers on every airplane. Great job, everyone!

And now, the gory details...

Quickie Rat	**heat**	**final**
1)Les Akre	3:07.96	6:13.85
2)Bill Lee	3:05.12	6:40.44
3)Paul Gibeault	3:00.69	102 laps
4)Bill Bischoff	3:24.80	
5)Charles Barnes	3:35.69	
6)Melvin Schuette	0 laps	

Former President Melvin Schutte Releases Dale Gleason's Super Slow Rat Entry after a quick pit.

Super Slow Rat	**100 laps**
1)Bill Bischoff	5:14.61
2)Mike Greb	5:39.34
3)Charles Barnes	5:45.18
4)Dale Gleason	6:02.84
5)Les Akre	6:03.26
6)Bill Lee	6:04.10

Sport Goodyear	**heat**	**final**
1)Bill Lee	4:07.25	8:13.97
2)Mike Greb	4:11.61	8:21.18
3)Les Akre	4:10.81	58 laps
4)Bill Bischoff	4:13.75	
5)Paul Gibeault	4:14.46	
6)Patrick Hempel	4:20.97	
7)Allen Deveuve	4:25.15	
8)Chuck Barnes	4:46.08	
9)Charles Barnes	4:46.35	
10)Raymond Blanchard	4:50.02	
11)Melvin Schuette	5:32.68	
12)Dale Gleason	47 laps	

Happy Sport Goodyear Winners Bill Lee with Pilot Patrick Hemple.

Fox Goldberg	**final**
1)Patrick Hempel	9:51.71
2)Charles Barnes	11:17.52
3)Dale Gleason	129 laps
4)Melvin Schuette	0 laps

Mouse I	**heat**	**final**
1)Melvin Schuette	2:29.95	5:09.60
2)Bill Lee	2:23.03	5:13.25
3)Les Akre	2:33.27	5:19.34
4)Patrick Hempel	2:33.61	
5)Chuck Barnes	2:35.	
6)Charles Barnes	2:39.69	
7)Mike Greb	2:41.01	
8)Bill Bischoff	2:50.54	
9)Paul Gibeault	3 laps	

Charles Barnes and his 5th place Quickie Rat Entry.

2016 SOUTH CENTRAL FINAL TOP 20 (includes NATS)

MOUSE I	**50 laps**
1)Bill Lee	2:23.03
2)Bill Lee	2:29.63
3)Melvin Schuette	2:29.95
4)Bill Lee	2:30.28
5)Patrick Hempel	2:31.32
6)Melvin Schuette	2:31.58
7)Melvin Schuette	2:32.14
8)Patrick Hempel	2:32.80
9)Les Akre	2:33.27
10)Bill Lee	2:33.47
11)Melvin Schuette	2:33.58
12)Partick Hempel	2:33.61
13)Chuck Barnes	2:35.00
14)Chuck Barnes	2:39.55
15)Charles Barnes	2:39.69
16)Melvin Schuette	2:36.12
17)Melvin Schuette	2:37.80
18)Chuck Barnes	2:39.46
19)Melvin Schuette	2:40.18
20)Mike Greb	2:41.01

Busy Pitman Mike Greb releases an SSR entry (top) and prepares to start an Quickie Rat Entry (bottom).

MOUSE I	**100 laps**
1)Patrick Hempel	4:53.99
2)Patrick Hempel	4:59.22
3)Patrick Hempel	5:04.47
4)Melvin Schuette	5:09.60
5)Bill Lee	5:13.25
6)Bill Lee	5:13.33
7)Patrick Hempel	5:18.22
8)Mike Greb	5:18.55
9)Les Akre	5:19.34
10)Chuck Barnes	5:25.48
11)Patrick Hempel	5:26.95
12)Mike Greb	5:29.34
13)Melvin Schuette	5:30.29
14)Melvin Schuette	5:32.00
15)Melvin Schuette	5:35.5
16)Mike Greb	6:50.94
17)Mike Greb	8:00.86

FOX/ GOLDBERG	**140 laps**
1)Patrick Hempel	9:51.71
2)Rod Christie	10:20.41
3)Charles Barnes	10:26.70
4)Chuck Barnes	11:17.52
5)Melvin Schuette	11:58.56
6)Dave Ek	12:11.57
7)Rod Christie	13:51.
8)Dale Gleason	136 laps
9)Dale Gleason	129 laps
10)Patrick Hempel	78 laps

Les Akre, shown pitting his Quickie Rat (top) and Mouse 1 (bottom), also pitted team mate Paul Gibeault's Entries. The "Les Paul" team was bussssyyy!

SPORTSMAN GOODYEAR 80 laps

1)Bill Bischoff	4:03.85
2)Mike Greb	4:06.29
3)Bill Lee	4:07.25
4)Bill Bischoff	4:07.47
5)Dale Gleason	4:07.82
6)Mike Greb	4:08.81
7)Bill Lee	4:09.54
8)Les Akre	4:10.81
9)Mike Greb	4:11.61
10)Dale Gleason	4:11.99
11)Bill Bischoff	4:13.75
12)Mike Greb	4:13.97
13)Paul Gibeault	4:14.46
14)Mike Greb	4:15.93
15)Mike Greb	4:16.65
16)Bill Lee	4:18.12
17)Mike Greb	4:18.59
18)Bill Lee	4:20.65
19)Patrick Hempel	4:20.97
20)Patrick Hempel	4:22.28

A secret Spy Photograph Showing Pitman Mike Greb Piloting. You saw it here first folks!

SPORTSMAN GOODYEAR 160 laps

1)Bill Lee	8:12.45
2)Bill Lee	8:13.97
3)Mike Greb	8:21.18
4)Bill Lee	8:25.46
5)Bill Lee	8:27.91
6)Bill Bischoff	8:32.20
7)Bill Lee	8:40.36
8)Mike Greb	8:42.40
9)Bob Oge	8:44.60
10)Bill Bischoff	8:48.95
11)Mike Greb	8:50.26
12)Mike Greb	8:52.90
13)Bill Bischoff	8:57.99
14)Bill Bischoff	9:01.21
15)Mike Greb	9:20.70
16)Bill Bischoff	9:21.90
17)Bob Oge	9:22.17
18)Patrick Hempel	9:25.10
19)Patrick Hempel	9:28.76
20)Bill Lee	9:36.90

SUPER SLOW RAT 100 laps

1)Bill Bischoff	5:14.61
2)Bill Bischoff	5:15.72
3)Bill Bischoff	5:25.09
4)Bill Bischoff	5:25.26
5)Mike Greb	5:28.90
6)Mike Greb	5:39.34
7)Mike Greb	5:44.17
8)Bill Lee	5:44.21
9)Charles Barnes	5:45.18
10)Dale Gleason	6:02.84
11)Les Akre	6:03.26
12)Bill Lee	6:04.10
13)Les Akre	6:04.61
14)Bill Lee	6:08.72
15)Mike Greb	6:10.37
16)Dale Gleason	6:18.56
17)Patrick Hempel	6:22.21
18)Bob Whitney	6:40.74
19)Bill Lee	85 laps
20)Charles Barnes	81 laps

QUICKIE RAT 70 laps

1)Paul Gibeault	3:00.69
2)Bill Lee	3:05.12
3)Bill Lee	3:07.80
4)Les Akre	3:07.96
5)Bill Lee	3:07.98
6)Bill Lee	3:08.46
7)Bill Bischoff	3:24.80
8)Bob Oge	3:25.04
9)Bill Bischoff	3:31.14
10)Charles Barnes	3:35.68
11)Bill Bischoff	3:55.15
12)Chuck Barnes	4:06.51
13)Les Akre	39 laps
14)Charles Barnes	36 laps
15)Paul Gibeault	35 laps

QUICKIE RAT 140 laps

1)Les Akre	6:13.85
2)Bill Lee	6:40.44
3)Bill Lee	7:33.20
4))Bill Bischoff	7:52.25
5)Chuck Barnes	8:13.57
6)Bob Oge	128 laps
7)Paul Gibeault	102 laps

SOUTH EAST- Jim Bradley

This write-up comes from a Mouse Expert, Bob Whitney. I have edited it slightly to clear up a few things.

Mouse one is one of the hardest beginner events ever.

As with all racing, the right combination of parts makes it go and become a winner. Starting without a good flying plane the rest is a lost cause.

There are 3 very good flying Mouse 1 airplanes, the Streaker, John McCollums McMouse, and the Prowler. There are plans for the Streakier and the Prowler. John's plane has an aluminum wing but it could be built with a basswood-balsa wing.

What makes a good Mouse 1 airplane? It needs to take off without the pilot worrying about it coming in on him. More wing tip weight is better that not enough. It took a while to realize that a Mouse racer can be too light and almost impossible to whip back to the pit man. The wheel and landing gear should be mounted to the fuselage in the right place. A good starting point is to locate the bottom of the wheel about 15 degrees forward of the model CG location. Use good music wire or an aluminum landing gear strut for a no bounce landing.

The model needs to be strong. Make the stab from 1/16 plywood or basswood. A balsa stab will break half way through the finals when you are leading! The wing can be all basswood or just a basswood leading edge and balsa in the back. Make sure to have a solid bell crank mount, this is very important. The fuselage should be basswood with a strong front end. The engine should be mounted to a piece of 3/16 aluminum. I machine a slot in the aluminum that fits into the fuselage. Then build up the motor mount fairings with basswood or 90-degree aluminum angle. Wrap some light fiberglass cloth around the front end of the fuselage and give everything 2 or 3 coats of finishing resin.

The engine is the heart of a good Mouse 1 racer. The critical part of the engine is the piston and cylinder. Without a good piston and cylinder fit all else is lost. Spend time finding a good piston and cylinder set, and then be sure to break it in correctly. The second critical part is the reed, it must seal completely or the engine will run erratically.

The glow plug is also very important. Many fliers try to run too much compression. The fuel should contain about 30% nitro methane. Trying to run too much nitro methane means not getting enough laps per tank and that can be a problem. It is also important that the fuel contains some castor oil, a 50/50 mix of castor and a good synthetic is a good starting point. Adjust the compression slowly. Start low and gradually increase the compression by REDUCING the number of glow plug shims. It is very important that the glow plug last the whole race.

Props are all over the place, you are on your own here. APC and Cox carbon combat props are a good starting point. Many fliers use too small of a prop. Try to run the biggest prop that you can and your engine will live longer.

The last part of the equation is the pilot and pit man. Practice, Practice, Practice. The pilot needs to fly the plane enough so that he knows what to do whenever the engine quits. The pilot needs to know the shortest distance he can put the model down safely to the pit man. The pit man needs to be comfortable with his equipment and have the battery set up for an easy connection. The pit man also needs to figure out the best way to hold the plane so that he doesn't need to swap hands when refueling. Finally, the pit man also needs to work on his starting sequence for a good one flip start.

Bob Whitney

WEBMASTER - Bill Lee

As you hopefully have seen by now, the NCLRA under Bill Bischoff's leadership is making some significant changes. Most notable is that the membership in the organization is FREE and that the newsletter is available to all and not constrained for a year to current members.
Obviously, with no membership dues, any costs for running the organization need to be minimized.

Recently we made a change to the website. No, nothing that you would easily notice if you visit, the major result being a LOT cheaper for NCLRA.

I personally am responsible for six different websites. You know about the NCLRA website, but I also host two other clubs, two commercial sites and my own personal site. These six sites were mostly hosted by a company where support and service had deteriorated dramatically and cost continued to go up. It was also a PITA for me to have to bounce around the 'net doing maintenance when needed. In order to consolidate these sites, I established a 'reseller' account at a new web-hosting company.

Over the course of a month starting in mid-October. I re-hosted all six sites into my reseller account and all are now up and running. Cost for NCLRA (and each of the others as well) will be quite a bit less. As an example, the NCLRA site was about $200/year before, but will be less than $40/year now.

I invite everyone to please take a look at the Website, and let me know of anything that doesn't seem to work as expected, or improvements that you might want. The website is NCLRA.org

Regards, Bill Lee

The "Winners Circle" at the 2010 Northwest Regional C/L Championships: L-R: Mac Ryan &Todd Ryan (Team Ryan from Washington State), Paul Gibeault (from Alberta, Canada), John Thompson & Mike Hazel (The Nitroholics Racing Team from Oregon).

The Revised 2011 Gibeault Mouse Race Program

By Paul Gibeault

AMA Class 1 Mouse Racing objective: It is the purpose of mouse race to fly up to 3 models in direct competition in 50 lap preliminary heat races leading up to a 100 lap feature (final) race. A minimum of 1 refueling pitstop is required in the heat(s) & 2 pit stops in the final. The winners are those with the best scores (times) in the feature race. The engine requirement is any reed valve engine with an integral tank. This means 99% of racers use some form of a Cox Black Widow .049. It has always been a favorite of mine because **no machining equipment is required to be competitive.** There is no restriction on aircraft type other than it must be able to take off from the ground (ROG) with a fixed landing gear. It's cheap to fly but oddly enough, cubic dollars have little to do with how you place in competition. The deceptively simple looking Cox .049 engine has been known to stump even the most experienced modellers, causing great frustration. The following article represents much of what I have learned in my 45 years of competition in this event. It is my hope that those wanting to fly with high performance Cox reed valve engines will find it useful. This is a much updated version of my earlier article.

Engine

1. Crankshaft/Crankcase Assembly

Problem: Cox .049's (when pushed really hard) are prone to breaking the crankshaft. Usually the crank pin parts company from the crank throw web.

Solutions: The use of the Cox "race car" crankcase assembly reduces this problem as the crank throw web is noticeably thicker on these variants, but they are noticeably slower so that's not so good. Davis Diesel cranks can work BUT you really must bench run them first! REASON: Due to tolerance mis-matching many DDD cranks run very slow & give very poor starting & running characteristics. It's a real gamble. The safest bet is to use Cox "Killer Bee" cranks, for greatest longevity & speed, but with one proviso. You must use a 5-40 prop stud screwed **all the way into the crankshaft.** You will then need a Cox (or equivalent) spinner to hold the prop on. IF you use the standard 1" Cox prop screw, the crank will shear off at the spines later on down the road. The fitting of a prop stud seems to have cured the crank shearing problem.

A 5-40 TPI prop stud (screwed ALL the way in) & spinner is used to prevent the Killer Bee/Venom type crankshafts from shearing at the splines.

Using a modified crankcase with a bronze sleeve bearing in the crankcase can be useful, but it's a gamble. Unless the clearance honing is perfect, it can be noticeably slower than stock. My experience has shown that Cox's hard anodizing makes for a very good bearing surface, and so the stock Killer Bee or Venom setup is more than adequate. It's a good idea to lay some 400 wet/dry sandpaper over a piece of glass, and with the addition of some oil sand the back of the crankcase. This will remove any burrs that might otherwise prevent a perfect seal with the fuel tank. It's also useful to use a 2-56 TPI bottoming tap on the crankcase holes as extra threads in that area help.

It is very useful to disassemble the crankcase assembly. Thoroughly clean everything, and then polish up the crankshaft & crank pin with 600 fine sandpaper to remove any nicks scratches or baked on oil that may be present. For re-assembly, use a 5-40 socket head cap screw & an old prop to draw the crank squarely into the drive plate. When re-assembled clean & dry, give it a spin. It should be really free with no binding whatsoever. On the best examples, the crank throw will even rock back to the bottom. The best engines have less than .015" end play on the driveplate.

2. Integral Fuel Tanks

Problem: The stock fuel tanks can be slow and sometimes short on range. They also may have trouble holding a consistent needle valve setting (due to leakage).

Solutions: Use one of the larger 8cc stunt tanks for the greatest range. These are commonly found on Golden Bee, Super Bee, Black Widow & Venom engines. Since the stock needle valve w/ spring arrangement is prone to leaking, modify the needle valve assembly as follows. Remove needle valve, discard the spring, install a #4 flat washer, and then add a piece of medium silicone fuel tubing. Inspect the tip of your needle valve to make sure it's not bent. Re-install the needle valve and you now have one cheap, but air tight needle valve assembly.

(Top), needles showing the tubing seal mods, (bottom) damaged, and good needle tips.

With the tank and tank back together, check that the venturi size is .082" I.D. If not, drill out the tank and tank back inlet venturi to .082", (this is what the record holding engine used). Drilling out the venturi larger than .082", sometimes produces an rpm gain, but often your engine **won't run as steady** and your range will be less. To me, it's just not worth it. Next, sand the metal tank back flat over glass (again with the 400 paper), as some tank backs are warped a bit & do not sit flat when bolted to the firewall. If you wish, you can use a Dremel tool to grind away the screen holder from the venturi area of the tank back. It looks racy, but I doubt that it makes any difference.

One not fully explored area of performance is tank venturi & tank back mis-match. It is thought preferable (& sometimes works) to have the tank backplate venturi a few thou. **smaller** than the tank venturi. A too large tank venturi (i.e .089") can sometimes be made to work with a smaller .082" tank back. One reliability mod all my engines have is a "clearance groove" filed on the tank. This groove provides a clearance for the bottom of the piston when the ball socket joint gets loose at BDC. If you haven't done this, you can probably see where the piston skirt bottom has been hammering a small groove already. (Dave Layman of Boss Engines cures this by machining .010" off the bottom of the piston)

The fuel pickup absolutely **must** be located at the outboard corner of the tank. The normal neoprene tubing arrangement is prone to moving out of place & giving an unstable engine run. I bend a piece of 3/32" O.D. soft aluminum tubing & make the pick-up one solid piece. I file a chamfer at the bottom of the pick-up tube so that it fits perfectly into the backplate. Attach it to the tank back with a short piece of **tight fitting** silicone tubing.The net effect will be that the pick-up stays perfectly positioned. You will notice greater range & stable running from your engine, with a properly positioned fuel pick-up tube.

The replacement pick up tube is bent from 3/32" O.D. soft aluminium tubing & chamfered at the bottom to fix exactly. Silicone tubing attaches it to the tank back.

The next step is to prevent the integral tank from leaking. This is a **must** if you wish to hold a consistent needle setting, and have the engine shutdown properly. In some cases it may be necessary to wrap a piece of 1/2A dacron line or dental floss around the entire peripheral groove of the tank to help seal it. Hold the thread in place with saliva or oil for final assembly. It may help to lap the metal tank & tank back joint instead of using thread. The use of a thread gasket is not necessary if you're using one of the newer nylon tank backs.

*NOTE: The metal tank backs are much **more durable** & will often survive a crash without breaking. The newer nylon backplate is much **more fragile**, & will often be damaged the very first time you crash. Metal backplate fitted engines finish more races whenever flying incidents/accidents are involved. In order to finish first...you must first FINISH!

High-Power: The original Cox copper/beryllium reeds tend to 'float' at ~17,000 rpm & so they are not optimal for top performance. In a reed valve engine, top performance is only attainable by using the clear mylar reed. I find the cross shape better in tanks that use a 'G-Clip reed retainer wire & the rectangular ones better in the tanks using the nylon retaining cap. This last production change allows reed engines to be on par with "TeeDee's" in performance! My test bench results indicate that 24,000+ rpm is achievable for steady-state running with such reeds.

What about 'other ' reed materials & shapes? Cox engine designer Larry Renger prefers the Cox stainless steel reed over the mylar reed. My main concern with the steel reed is that it wears the anodizing right off the mouth of the venturi tube, although the rpm seems to be the same. I've tried other reeds made of thinner steel, flopy disc material, etc. & so far haven't found anything better. One Australian made metal reed was indeed 300 rpm faster, but it broke away after only a few minutes of running.

After final assembly, the tank screw hole areas are filled with RTV silicone sealant for leak prevention.

Teflon reeds may or may not work as well. I've not found them to be any faster, & sometimes worse. The final reed sealing check is done by attaching a piece of tubing to the tank venturi & sucking on it. A proper fitting reed will hold the pressure & **not leak.**
Final Assembly: Clean the 2-56 tank screws with thinner. Final assembly is done using blue Loctite threadlocker. Every time you tear down the engine, replace both the paper tank gasket and the venturi o-ring. This may seem like a waste, but $2.00 worth of new gaskets now is $100.00 worth of reliability in the racing circle! Once assembled, apply an RTV type silicone sealant over the tank screw head area. The tank screw heads are a major source of leakage & this really seems to help. Removing the sealant is very easy if you need to remove the screws later on. ****NOTE:** Some Cox engines have been supplied with screws that are up to **.115" longer than normal.** Often these engines will have the tank leak & come loose during running! Bottom taping the c/case screw holes can help here OR use the proper length screws in the first place. It took me an awful lot of wasted time, lost races, & loose leaky tanks before I found out what exactly was going on here. See Photos to note the difference. *Note: If you really hate paying a paltry few bucks for new gaskets, they can be home made. Cut from the tank gasket from thick vellum paper & from a piece of silicone tubing, thinly slice the venturi o-ring...

This example is over .100" longer than Standard! Too long and the tank won't seal.

3. Piston/Cylinder Assembly:

Problem: Not enough power!
Solution: Any type of piston/cylinder assembly made by Cox can produce good results. However, a superior "fit" will overcome nearly any porting deficiency. This means that a well fitted "Babe Bee" piston/cylinder is better than a bad "TeeDee" piston/cylinder. I recommend a flying test for all piston/cylinder assemblies in your possession, as certain assemblies will occasionally defy all rules of performance. Having said this, I find that good fitting "TeeDee" #4 piston/cylinder assemblies to be excellent. Many of the the very fast engines use these. The Cox Venom cylinder porting seems to be consistently fastest. With just a little Dremel work, you can make your TD cylinders identical. Personally, I rarely grind in my own cylinders as I'm afraid of doing more harm than good...
Aftermarket pistons: Some enterprising individuals have offered for sale standard Cox pistons that have been lightened by grinding the piston skirt on the inside or by cutting the skirt off at the bottom causing increased Sub Piston Induction (SPI). Actually these mods can be useful, if & only if **the fit to the cylinder is good.** If the fit is wrong then all is for naught. So of course, a test run is always in order when going with this piston type. A note on SPI numbers: Measured with a feeler gauge, SPI should be in the range of .012" - .025". I've yet to determine exactly how much SPI is too much...
Ball-Socket Resetting: It is worth noting that new Cox pistons often come with the connecting rod ball-socket joint set too loose. Therefore it's a good idea to re-set the fit with a Cox factory tool to .002" slop, or less. Using the wrong piston holding fixture can result in a mushroomed head piston (totally ruined), so I don't use one. Clean the socket area with acetone or brake cleaner first to remove the oil. Then lay the piston on a heavy piece of ½" plate glass or flat thick piece of steel (something quite dense like a vice). With the tool in place, tap with an 6-8 oz. hammer, rotate a bit, tap again and continue, checking often until all excess play is removed. Use lots of small taps & check the play often. It is necessary to check this joint after every contest. At normally low rpm's this isn't critical. However, at racing rpm's (20,000+) a loose ball-socket joint reduces piston life to a few minutes.
Piston Fit: Optimum piston to cylinder fit needs to be checked with parts being absolutely clean and dry. To check the fit, slide the piston up the cylinder bore (with no finger prints!) until it sticks. Ideally, it should stick flush with the glow plug land or even slightly higher. Now with a slight tap of the finger, the piston should fall right out of the cylinder. If the fit is slightly looser this may be OK, unless starting consistency deteriorates. In this case, the piston is worn too far for that particular cylinder. Keep it to try in other slightly smaller cylinders in your collection later on.
Please note that some new TeeDee piston/cylinder assemblies are fit just a bit too tight. Those of you with an excellent feel can go ahead and lap the piston to fit. However, Dale Kirn's easier way to do this is by just running in the engine. Start by cutting down a 5x3 prop until it turns up to 24,000 rpm rich. Run up to 2 dozen tanks of fuel through the engine, but for no more than 2 minutes at a time, to allow for cooling in between runs. It is better to use a TeeDee crankcase for this purpose, and transfer the piston/cylinder assembly to the reed valve

crankcase when it is run in. The reason being that at 24,000+ rpm some reed valve crankcases will wear out quickly, notably the non anodized cast R/C Bee type.
Lastly, it is **very important** to keep carbon varnish off the piston and especially the cylinder walls. #000 steel wool or medium grade Scotchbrite wrapped around a small dowel wet with solvent easily removes all the carbon. This procedure takes only a minute, but really should be done before every contest to ensure peak performance. **Note: the Davis de-varnishing brush can also be used, but be careful not to get carried away. Bob Davis recommends **only a few strokes** as his brush actually hones the cylinder. Used vigorously & too much can cause 'over-honing' making the piston fit too loose. Do be aware of this possibility.
Cylinder orientation: This is something very mistakenly taken for granted. I don't know why exactly, but I've had certain engines lose massive rpm or just ***'run funny'*** by mounting the cylinder sideways. That's expressly why my engine cylinders are all mounted upright. Mounting the cylinder sideways also exposes the needle valve to damage in case of a flip over. I will allow that the odd racer seems to be able to get it to work OK for them. All I will say is, try a back to back flight test & note how stable your engine runs **before** going this route.

4. Glow Plug
I use Cox TD high compression glow heads for maximum reliability & stable running on a new (or newly rebuilt) engine. My engines also start out with 4 new head gaskets. A good rule of thumb is one head gasket for every 10% of nitro. (hence 35% nitro = 4 shims)
After removing a new Cox plug from it's package, carefully sand the seal band on a plate of glass with 400 paper and oil. This will ensure the plug seal area is flat, and will seal properly when tightened. Now examine the plug element, and with a T-pin, make sure the coil is centered. Finally with a T-pin, very gently pry at the element where it is welded to the plug. It should be a firm weld. If it breaks loose (which won't happen often) you'll unfortunately need a new plug!
After awhile, you may notice that your glow head keeps coming loose in flight. This is due to the copper head gaskets becoming old and hardened due to the constant heat cycling. Since the Cox engines use an annealed copper gasket, replacing the head gaskets with new ones will solve the problem. *Note: I've heard that annealing the gaskets with a torch can work, but have no experience doing that. I find removing gaskets from a cylinder is easier when carefully using a very thin surgical blade or a Davis brush. A micrometer or calipers is really useful here as the odd head shim is thinner than the standard (.005") giving a less than desired head clearance. Head gaskets can also 'fuse' together & the calipers can easily show this.
A cox replacement head manufactured by Doug Galbreath that uses the Nelson HD plug can offer better performance at less than half the cost (per plug). These are certainly worth using once you have a **stable** running engine set up. On the odd engine they run **slower** than normal, which is why you need to use the TD plug as your performance reference. The Galbreath/Nelson head often gives harsher running until your engine warms up, so go easy on the needle adjustment until the engine gets hot. (note: Some Nelson HD **plugs** have been found that don't fit the Galbreath head properly & this has been found to cause the performance decrease).
There are other glow head alternatives in the form of the Norvel 'Speed Plug' & the Merlin plugs. I do not have enough experience to know if they work well or not. They are certainly worth exploring though. Melvin Schuette has certainly shown the Merlin plug to work well in mouse.
RPM Performance numbers: Ah...it's pretty easy to banter about high performance rpm numbers, but really they aren't meaningful unless one compares apples to apples & under the exact same conditions of prop, fuel, & weather. And YES, I can get some very impressive rpm numbers with 70% nitro, high compression & a large venturi size at sea level. BUT, such an engine will rarely finish a mouse race...so, let's get real. To that extent using Sig 35% nitro fuel, an **APC 4.75D X 4P prop** & Galbreath head, (w/ my 'local Leduc weather'): 19,000 rpm is my minimum standard. 20,000 is quite a "good engine" & 21,000+ is superior. Increasing nitro content can easily give a boost of 1000+ rpm over these figures, BUT the engine/glow plug **reliability goes down proportionally.**

5. Miscellaneous Problems
Problem: Engine comes loose in flight, prop falls off, glow plug comes loose in flight.
Solutions: 1. Use the right length tank screws with silicone sealant on top. 2. Check tighten the glow plug, prop spinner, & mounting bolts before every race. 3. If field disassembly can't be avoided, use Loc-Quik super primer T accelerator, with blue Loctite thread locker upon re-assembly. The tank back can be sealed on the field using a single piece of sticky Fascal tape over the entire backplate with only the venturi area cut away.
Airframe & Race Equipment
Airplane: In my opinion, there is no better design **to start with** than the rugged record holding Streaker Mk V.

Centering APC props w/ a big prop hole: Use of a bushing, aluminium tape or thin fuel tubing can all be used here.

Prop: You must use 4" of pitch to get rolling! Any 1/2A prop made by Cox, Tornado, Top Flite or APC is OK. However, cut down props (less than 5" diameter) go faster than stock. Only test flying will determine which prop(s) ultimately work best for a given combination. The tough & forgiving Tornado Black 5DX4P cut to 4.75" diameter has won the Nat's final, so you could start there. The APC 4.75D X 4P is my personal **reference standard** & and was used to set my last (2:14) heat record. The Trimming the diameter to 4.5" is also a reasonable choice, if you want a lighter prop to use in poor weather or if your engine is down in RPM a bit.

Fuel: A minimum of 25% nitro is required to get with the program. A 60%+ mixture, yields faster times, but only if everything else is correct. i.e. You have fabulous reliability on lower (35%) nitro, are practiced and know what you are doing! Be prepared to buy lots of expensive glow plugs as well!
A most important note about Cox .049 fuel: A minimum of 5%, & preferably 10% of the oil mix must be castor oil. Should you decide to race your Cox .049 on a castor oil deficient fuel, your engine will commence a course of self destruction, and you will find out first hand why some have sworn off flying with Cox engines for good! **YOU HAVE BEEN WARNED!**
A truly good performance mix for Class 1 Mouse racing is Sig Champion 35% nitro fuel. I have found it to be the only fuel I need to consistently make the finals at the U.S. Nats, and win anywhere else.

Pre-Race Start & Warm-Up

1. Before the first run, always prime the crankshaft with oil or raw fuel for additional lubrication at this critical time.
2. Fill tank, prime exhaust, and wind up the spring starter 1 ¼ turns to start. Anything less than 1 ¼ turns will allow your engine to start backwards. 1 ¼ turns ensures a correct start **first time every time.**
3. Most Cox .049 engines do not take a really good needle setting until warmed up (especially with the Galbreath/Nelson head combo). Therefore don't be surprised if the ground and air settings differ, sometimes as much as ½ a turn! The best time to fine tune the needle valve is immediately after a flight. Important note: If your needle valve setting changes by more than a ½ turn, you have a fault! Clean or flush out the dirt, but stop perpetually messing with the needle valve. A non-responsive needle valve most often means **you have a tank leak !**
4. To stop a running engine on the ground, squeeze your thumb and index finger over the tank vents. This will verify your tank seal. If the engine doesn't stop, but continues running, then you have a sizeable leak somewhere that needs to be fixed as soon as possible! Pressurizing a full tank with a fuel bulb can often pinpoint where your leak is.
5. I have mentioned earlier that Cox crankshafts may have a fatigue problem when run really hard on high nitro fuel. You can accelerate all kinds of shaft and crankcase wear problems by stopping a running engine by it's prop nut. **Do not do this.** Stop the engine by blocking the vents & pointing the model's nose down. You will increase the life of these parts considerably, as well as save yourself some grief.
6. Always monitor the color of the engine exhaust oil. Usually a good running engine will alert you in advance of an impending failure by "making metal". This usually means tiny aluminum particles are being rubbed off and are visible in the exhaust oil, if you look closely. This is usually accompanied by frequent plug failures. At this point, it's best to find the trouble spot and fix it. When this happens, I replace the whole crankcase assembly, because the crankpin has worn (tapered) causing the rod to slide off the crank pin and rub away at the tank. Examine your tank regularly. If you notice excessive rubbing, (see photos) you'll need to replace your c/case ass'y or crankshaft at minimum. If you are able, use the newer type tank that incorporates the nylon reed retainer. A steel crank pin rubbing on nylon is much preferable to one rubbing on aluminum. Again, watch for excessive rubbing on the nylon reed retainer & replace the offending worn parts as necessary. (Note: if your crankcase ever makes a squeaking noise on startup, or shutdown, it's caused by that particular reed. Change it only if performance is down).

Black Widow tanks: note severe wear around reed flange holes on reed retainer(Top) excessive wear on top of reed retainer (Bottom) cracked retaining "G-Clip area and reed seal venture hole area.

7. Always keep your engine clean and always protected from corrosion with a plastic bag or rag. Always filter your fuel, especially when changing containers. Ensure your fuel bulb is in good shape and not cracked, or flaking rubber. Better yet, **replace it yearly** for a paltry $4.00 and don't worry about it. When everything checks out OK, and your engine still hics and coughs, it's very possible that dirt in the fuel system somewhere (or bad fuel) is causing the problem. It doesn't take much dirt at all to raise havoc with a Cox reed engine which is why it's just so important to keep your motors **scrupulously clean.**

Tips and Suggestions
"The Engine"

I assume that if you followed my engine set-up tips, you should have a very decent running engine. The later Cox "Venom" engine can make you competitive quicker (due to the slightly better cylinder porting & better crank balance), but I strongly recommend one change. In the original production batch of engines, they varied from designer Larry Rengers' original drawing & made the piston too thin at the top. This caused the piston top to separate in as little as a half dozen runs. My cure has been to fit up a TeeDee piston to the Venom liner (as described earlier). Now you have one great running set up with no more piston failures. Using a "Venom" will not necessarily make you an instant winner. You still need to keep in mind all of the maintenance tips mentioned earlier. Besides, both previous AMA records (2:18:6 & 4:34:0) were held with a much older engine, (a Golden Bee w/ TD cylinder) so don't go throwing out "ole reliable" just yet.

Cox .049 mouse racing engine variants: Top L-R: Venom w/ Galbreath head & Golden Bee. Bottom L-R: Silver Bee & Black Widow.

"The Model"
I assume that you have built the all basswood Streaker Mk V with 2 ounce fiberglass cloth on the wing, stab & motor mount. Plus 1/4 -1/3oz. tip weight, for a total model weight of about 6 ¾ oz. **In this event only, heavier is better** at least to start off with.
You will notice this advantage in windy conditions (and when isn't it windy when flying Mouse!). Unlike many designs, the heavily tip weighted Streaker can darn near fly in a storm if need be. After all, anybody can fly in the calm…..but successfully flying in wind separates the men from the boys! However, if you have ignored the instructions and built your Streaker out of balsa instead, and without enough tip weight, then you will find out two things. 1) That it doesn't whip well flying high and falls out of the sky downwind, cart wheeling upon landing. 2) It builds momentum slowly and won't keep its speed up with a dead engine, and you end up crashing in a line tangle anyway.

Paul Gibeault's all Cox .049 powered Streaker mouse racing fleet ready to race.

When flying in rainy conditions it's the **pilots job** to wipe the lines with a soft cloth moistened with acetone. Do this prior to every race. Much of the sticky film buildup is caused by the oily exhaust residue produced during flight. If not cleaned often, the solid lines can stick together causing a loss of control, almost always with disastrous results. I have lost races neglecting this! I suggest a cleaning just before rolling your lines up for the day.
You need to use a good quality nose wheel, and solder it on with **Sta-Brite** silver bearing solder. Many racers have lost races when their wheel fell off during a race. **Regular solder just doesn't cut it here.**

"Piloting"
An otherwise great airplane/engine combination is obviously disadvantaged by poor piloting. Here are a few suggestions you might find advantageous. Since mouse races often involve line tangles, (surprise!) choose a pilot with combat experience. This type of individual often has a "never say die" attitude when lines from other (often crashed) models have him wrapped up. He just keeps on flying, no matter what. The lesson here is that not all line tangles will bring you down if you keep a cool head about you. A great pilot must train himself to not look at his own model, but watch his opponents models and his own pitman for signals. This allows him the important split second to see and avoid accidents just as they happen and fly accordingly.
Cox .049 reed valve engines unfortunately do not have shutoffs. This lack of a shutoff, often causes a fatal mistake as seen in the following scenario: You are flying along, just overtaking a slower model and your engine quits! You quickly lose airspeed and sink into the model you just overtook, bringing both models down in a line tangle. Happens frequently it seems, but consider this:

A great mouse pilot must:
Count and be aware of his laps at all times, i.e. Know what lap his model is on, and how many laps his model is capable of flying in traffic. (for this example, let's say 35 laps per tank) At maximum laps, less five (per example, 30 laps), **assume** that your engine will quit if you overtake. If you are approaching a passing situation at this critical stage; as you approach to overtake, quickly **whip hard** with just enough height to get by safely. Do not climb any higher during passing than absolutely necessary or your engine surely will quit! As soon as you have completed the pass, stop whipping. You shouldn't have to whip for more than a few seconds to accomplish this correctly. You may well be called for whipping, but better a penalty than a crash. Should your engine quit while passing, the whip momentum will allow you to complete the pass even with a dead engine! Such is the beauty of a properly weighted Streaker Mk V.

"Pitting"
An otherwise good pitman can cost you the race by launching your model **without first looking for traffic!** Sometimes you will be taking off just as another pilot is landing. A launch at this critical time involves you in an instant line tangle/crash, and disqualification from that race. The solution is "heads up" pitting. A great pitman must simply **'relax'** and hang on a second or two until it's safe and clear to release. You must remember to **always yield to the landing model.** Seldom is a mouse race lost by 2 or 3 seconds, but it's always lost on a pitting accident that results in disqualification. The pitman is also responsible for signaling when his pilot is being called for whipping and when he's due to run out of fuel. In very close races (or record setting), this becomes very important.

"Conclusion"
A winning Mouse Race effort can basically be put down to the right amount of **teamwork.** That is to say the ability of a good team working together in a nice flowing manner, **carefully avoiding accidents,** yields better results than a team with a killer fast model, but lack of team work and practice. I have been most fortunate to fly with my buddies, Roy Andrassy, Les Akre and Todd Ryan. Their superior piloting and pitting abilities have guided us to many victories. Thanks for all the great work guys, I enjoyed every minute of it! Thanks also to John McCollum, Dale Kirn, Joe Klause, & Larry Renger whose knowledge and expertise has helped me on many occasions & increased my knowledge base a great deal.
I wish to thank the rest of you fellow Cox Mouse Racers out there for coming out to race with us. If it wasn't for all of you, Mouse Race wouldn't be the one of the more popular racing events that it is today. I wish you all great success with your Cox .049's. Good Luck!

Source appendix for equipment:

1.Cox International: All the Cox parts you need + SUPER service. ***cox****engines.ca*
2. Ebay stores: Even more sources of Cox parts Ebay.com
3. Doug Galbreath: High performance Cox heads/plugs (F1Cdoug@aol.com)
4. Streaker plans available from: Paul Gibeault. (pgibeault@shaw.ca)
5. MBS Model Supply: Solid lines & racing supplies
PO Box 282
Auburn KS 66402
Contact Melvin Schuette
1-785-256-2583

Mouse Musings from Melvin

By Melvin Schuette

I originally thought about calling my article "How to Save $125.00", but decided not to name it anything. The $125.00 is what Paul Gibeault charges for one of his .049 engines.

What I would like to do is to tell you everything I know about setting up a Cox reed valve engine for Class I Mouse. However, I will be the first to tell you that I do not know everything there is to know about setting up an engine for Mouse.

The piston cylinder I use is a TD piston cylinder combo. I can't tell you how to fit a piston/ cylinder. All I do is to try different pistons in different cylinders until I find one that works. I have been also told you need to have the exhaust ports on the side, my current one has the exhaust ports in the front and back.

Currently I am using the Merlin 1/2A glow plug. This is a copy of the AME head. I found an 500 rpm increase using this glow plug. One thing I will warn you about the AME plug is that they do not like to be run under compressed. If you do it will run one time. The easiest way to tell if the engine is under compressed is to look at the element.
If it has been pulled down into the combustion chamber it is under compressed. I cannot tell you for certain if it is the same for the Merlin plug, but I have never tried lowering the compression on the engine just to see what would happen.

I use a silver crankcase; what I've been told is that when Cox anodized the cases they anodized both the inside and outside of the case. The anodizing can come off and go through the engine ruining the piston cylinder fit.

I use a silver, red or the yellow (from the Golden Bee) tank. The anodization of the Black Widow tank is said to be too porous to seal properly. The tanks I use also are the earlier version that used the wire to hold the reed in place. I have tried the plastic reed retainer, but the only way I could get it to seal was to put a paper gasket on both sides of the reed retainer. I also use the metal reed. I have been told that the Mylar reeds will work at a higher rpm, but I have not had any problems with the metal one. I use the metal back plate, along with drilling out the venturi to .09375". Dale Kirn, an Cox engine designer told me early on that anything larger will just cut down on mileage. I replace the o-ring between the back plate and tank every time I take the tank off the engine. To tell if you have a good tank seal; cover the vent tubes with your fingers with the engine running and it should quit. If it continues to run, you have a leak.

Believe it or not the length of the prop screw and or stud is critical. The screw or stud needs to be long enough to fit into the crankshaft far enough to get past the knurling on the end of the crankshaft. If you don't the crankshaft will break right where the knurling starts, and usually in the middle of a race.

The fuel I use I mix myself. The formula I use is one that Dale Kern told me to use. I use 40% Nitro with 20% castor oil. I have a 1000 mil liter graduated cylinder that I mix fuel in. After mixing a full cylinder of fuel I add ¼ ounce of Lubricin oil. People have told me that I need to change over to synthetic oil, I have tried it and it actually slowed my engine down.

The prop I am currently using has some people questioning if I should be allowed to use it. I use an APC 4.75 X 4.75 electric prop. On the package, it says not for use on gas engines. I would like to make a mold for the prop and see if I can get a carbon fiber or fibreglass copy to work as well. Prior to using the 4.75 X 4.75 prop I was using the APC 4.75 X 4 cut down to 4.5" with good results.

The current plane I am using is a Streaker. The only deviation from the plans is the use of ¼" aluminum for the firewall/ motor mount.

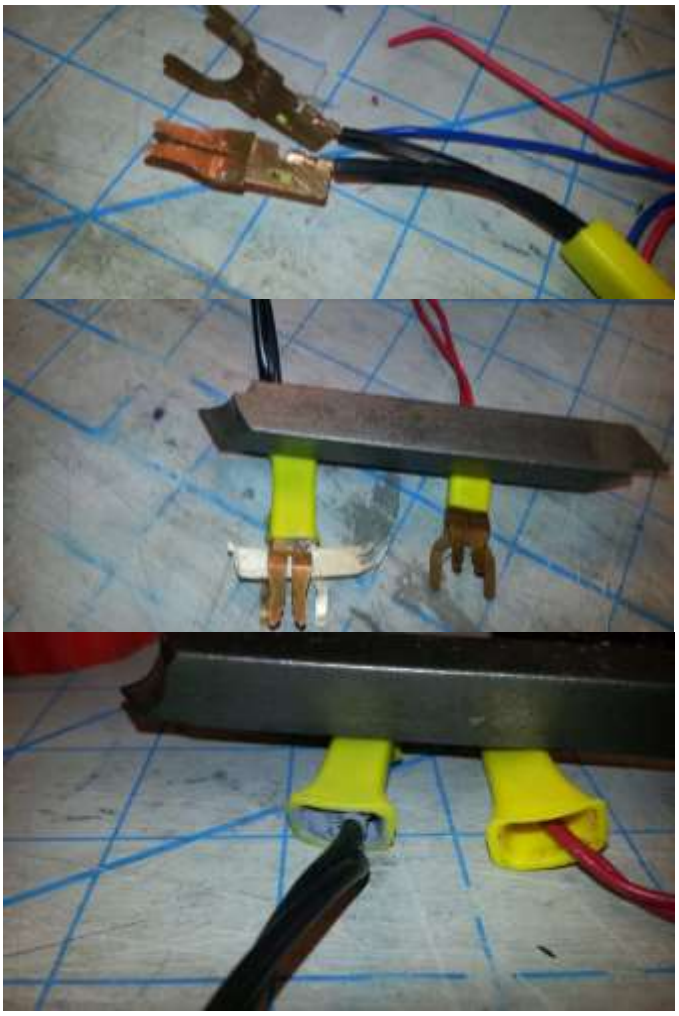
I cannot guarantee that if you do exactly as I do that you will get the same results, this is what I am currently doing and it works for me.

Clues to the Cox Clip Blues

By Paul Gibeault

"My Cox is hard to start" (or) " Paul is the only guy I know who expects his Cox's to start right away. " That was a comment overheard at the local flying field recently. Well, why shouldn't they start right away? Unless the piston to cylinder fit has gone away (i.e. spongy/low compression), the one thing all Cox 049's are capable of is quick starting. Even I have assembled the odd engine that won't start easily, but not very often. Assuming one has decent compression, a decent plug & decent fuel, quick starting is all but assured... or so I thought.

When starting out for the day's flying, it is customary for me to do a check of the glow plug on my glow plug clip. A good orange glow of the plug element is necessary for proper starting. One thing I had noticed is that certain glow plug clips I own require quite different amounts of battery power to make for a good glow. I generally use the variable rheostat Glo-Bee Fireplug batteries. In some cases in order to get a decent glow I had to turn the rheostat up to full capacity. Others worked at half the power setting. It didn't really twig my attention as to why that was, as long as I had my orange glow.



Cox Clip fitted with larger, low resistance wire, then sealed with RTV produced much better glow with less power.

The problem arose when my battery charge started decaying which naturally caused the glow to diminish & in turn causing poor starting. With the rheostat at full, I had no room to 'crank up' the battery. Why with some clips, but not others I wondered?

Well, after some digging I finally found my answer. **CORROSION** coupled with the tiny gauge Cox clip wire gives big resistance in the wire(s) needing quite a bit more battery power. One day when I went to change the standard wire to larger gauge wire I noticed at the clip ends that a greenish corrosion had set in. **AHA!** THAT would certainly cause the clip to become high resistance. So, armed with this knowledge, I've upgraded all my Cox clips to a heavier gauge wire. I've also silicone glued in the connection to prevent any possibility of shorting the wires & also vastly increasing the strength of the clip, so that there is no chance of damage when the clip is pulled off the running engine by the wires. I use a piece of balsa to ensure the metal plates are separated during the glue up. Now my clips only need a one half rheostat setting to provide a nice orange glow & are more resistant to damage.

The flash of my camera makes the element glow look less than what it really is in the photo.

Now my clips only need a one half rheostat setting to provide a nice orange glow & are more resistant to damage. I wish you all quick starting of your Cox engines!

I wish you all quick starting of your Cox engines (as it should be) !

Cheers, Paul (a.k.a. Mr. Mouse)

Tank Valve Made Easy

By Roddie

Hi Paul, I've really been enjoying your threads on Speed engine secrets! You said you like the idea of a valve similar to what John McCollum has. I think you could make one very easily... and all you need to do is drill a small #44 (.085") hole in the top of your tank. This is a clearance hole for a #2-56 machine screw. I am a collector of "springs" (lol).. and had some small "compression" type in my stock. I cut one down to length, that had an inside diameter just larger than the screw, to make the plunger assy. The valve is made by using a standard paper hole-punch on a piece of inner-tube rubber. The little rubber disc then gets pierced in the center with an awl over a pine block. A 2-56 nut and flat-washer hold it

The Roddie Tank Valve System, simple and inexpensive.

together. The machine-screw is 3/8" long.. and just clears the venturi tube when installing "head-side in". Very simple and easy! I made one up and took photos (attached) for a visual. Having the nut on the outside allows for adjusting the spring pressure.

Cheers!

Roddie

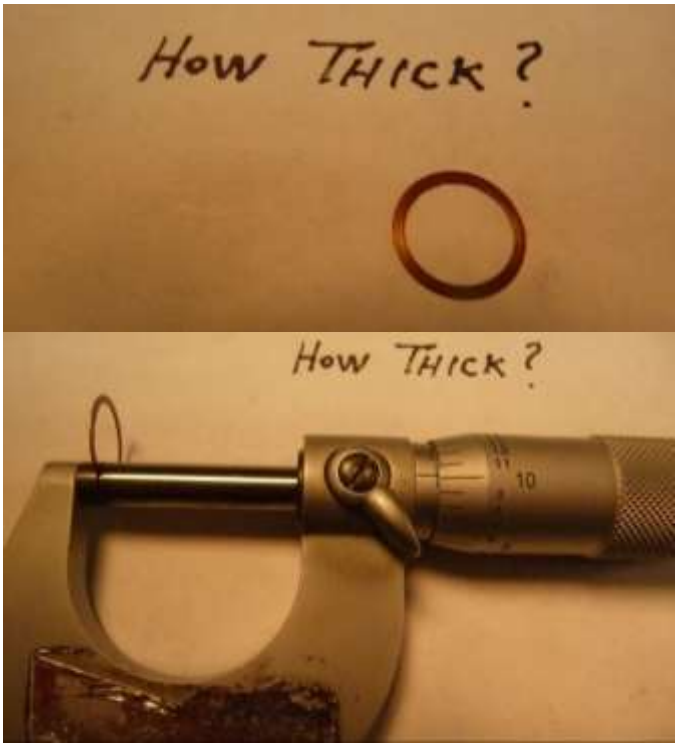
Shimming Your Way To Happiness

By Paul Gibeault

A shim is a shim is a shim isn't it??

Wait a minute...not quite so fast. In theory, all Cox .049 head shims are created equal, but in reality, this is not quite so. The master has found that some errant shims have found their way into his collection. Shown is the way I keep my assortment of Cox .049 shims organized.

Initially, all of my shims are measured. Precise measuring requires the use of a micrometer to find when 2 shims have been fused together like this one. It LOOKS like one shim but really ISN'T!



Other manufacturers of replacement Cox glow plugs use their own copies. I think therein lies the discrepancy...
As you can tell from my shim box, I have come across some shims as thin as .003". Of course that means that three .003"

shims (=.012") will certainly give you LESS head clearance than three regular Cox shims (=.015").

For the most part measurements of Cox shims fall between .005" (nominal) & .006". What may be the small difference here is that the .006" shims are really .005" material but curled up or rough around the edges from the stamping process during manufacture. The end all definitive measurement can be done with a blank plug installed with the centre post drilled out (or by using a Doug Galbreath head as shown, which allows for the same thing).

The depth gauge is set to zero with the glow plug sitting on a flat plate. Now with your shims installed with the head tightened down, a depth gauge measurement can be taken giving a finite head clearance number. You will note that this number (**head clearance** or **deck clearance** as it's sometimes called) will be a bit smaller than what you think it should be due to compressing of the shims.

So, for performance work it's most useful to know what head clearance you have inside a given engine.

Another item is how to remove & install head shims without damaging them. I use a Davis de-varnishing brush or a very thin sharp **surgical blade** with which to (CAREFULLY) pick the shims out with. Use care here as you don't want to scratch the cylinder bore. On occasion, the odd shim still gets damaged & will need to be replaced. Not a big deal as replacements are plentiful.

On installation, even I still damage the odd shim (see photo). I have had many shims that have been 'crunched' on installation & have ended up needing to be replaced. I know when this happens as the glow plug **feels funny** just before it snugs down tight. If unsure, I unscrew the plug & take a closer look, (often with a magnifier).

Once your happy with your head shimming, it's a good idea to keep your engine with it's build-up notes in a clean container for handy reference for when you may wish to make later changes.

Cylinder Shimming

I do get a few inquiries asking how to use cylinder shims. I have to assume you either have your own or want to order some direct from Darren Albert.
Due to random cutting from the automatic screw machine, not all Cox crankcases are machined exactly same. The difference can mean that your (factory spec.) Top Dead Center (TDC) may be off a bit. Strangely enough, a few thousandths of an inch difference can cause some serious RPM changes. The factory spec. (w/ a tight ball-socket joint) is measured when the piston top is flush with the cylinder land (cylinder top shelf). I find an easy way to check this is by drilling out the center of an old glow plug. When the old plug is screwed into the cylinder (w/ no head shims), it will come to rest right on the land. Now, with the piston on the c/shaft, screw the cylinder onto the c/case ass'y. Now gently rotate the c/shaft & see if the piston 'hits' at TDC. If it locks up, you will need shimming, if it doesn't hit at all, you'll want to gently sand down the top of the c/case using 400 wet/dry paper & oil. If the piston 'just' bumps the glowhead fixture but goes over, then the TDC is bang on.
The standard K/K shims come in .002/.003/.006" sizes. The 'shim holder' itself is .005" -.008" thick. So one has to play around a bit to find out what's needed for a particular engine. The Davis Diesel shim measures thick at .015" (which most often eliminates any SPI (Sub Piston Induction) your engine has). When using these shims, it's most useful to have a micrometer that reads in the ten-thousanth of an inch (.0001"). Such an instrument can tell when a given shim has been compressed over time & is no longer what you thought it was.

Once the piston height is set right, then most often the spec SPI will be right on as well (between .008" - .012").
Set this way, your head clearance (or "deck height") will be exactly what the thickness of your head shim(s)are. i.e. If you have two standard .005" shims, then your head clearance is now set at .010" EXACTLY. For top performance, this is something you'll need to know. How important you ask? If you get it wrong your engine can lose 1,000 RPM or more. Get it 'spot on' & you can see 1,000 RPM gain or more.

BUT, for some reason cylinder shimming isn't necessarily the FINAL WORD on set up. The cylinder exhaust ports orientation is also a part of the performance equation. My best performing engines seem to run with the exhaust ports facing between 45 to 90 degrees from the front. A straight forward facing exhaust port seems not as good.
Also, moving the cylinder up too much can cause the "pinch fit" of the piston to be less, because the piston does not go up as high. Sometimes this matters.

SO, moving the cylinder up or down affects:

1. Compression ratio
2. Glow plug height (from top of piston)
2. Piston to cylinder fit (pinch)
3. Exhaust port orientation (external) relative to the slip stream
4. Boost port & exhaust port orientation (internal relative to the c/case)
5. Cylinder port timing (relative to the piston)
6. Amount of SPI

I am simply AMAZED how this one little item can affect so many different parameters! There is a ray of hope though. If you need to raise your cylinder .005", then it's best to LOWER the head by the same amount (1 shim) in order to at least keep the compression ratio & plug height the same.

The bottom line is whatever you do, the result must be measured with a tach & noted on paper for reference. This is the MOST IMPORTANT TUNING TRICK I know of. On occasion, minor shimming doesn't seem to do very much so you need to know that as well. Some engines respond to shimming a lot while others, not so much. You can now tell from the above that there are numerous COMBINATIONS that can be arrived at by shimming. About the ONLY thing I'm sure of, is that you won't go wrong referencing your TDC at flush & it's a GREAT place to start off from. I can't say with authority that it's the ONLY way to set up an engine, but I've had good success personally.

FINAL NOTE: A standard Cox .049 can run OK with the spec. dimension being out of tolerance. It's mostly the

discerning modeler or competition engine man that will want to pay attention to this. Also for the "tinkerer" looking for that last bit of high performance, he can spend a lot of time on the test bench pursuing the ultimate set-up'
for his own particular engine. It's certainly tedious work, sometimes even boring... BUT, once in awhile a super combination shows up & makes it all worthwhile.
Then the next task is to duplicate the powerhouse motor (by the numbers) & wonder why it doesn't run as fast...

AHhh Coxes, ya gotta lov 'em!

Cheers, Paul (a.k.a. Mr. Mouse)

Cranky Davis Diesel Crank

Hello Paul:

I have put together a trio of Mouse motors. All slightly different configurations. I am converting the other two to the configuration which seems to run the best. Playing a bit with sub port induction by removing material from the bottom of the piston and then shimming the cylinder up.

I don't intend to run more than 40% nitro since I prefer reliability to all out power.

Incidentally, one of the motors I set up has a Davis crank.

- I had to grind relief into the diameter of the crank web to produce a counterweight.
- I then found that the front face of the crank web was rubbing the inside of the crankcase near the outer diameter.
- I machined relief on the front face of the counterweight and throw so that the front of the crank only contacted the case on the small trust surface adjacent to the crank.
- I then found the crank was too short, so that the crank would not turn with the thrust washer installed.
- I machined the front snout of the crankcase so that the end of the crank had .005" protrusion/.010" endplay with a Tee Dee thrust washer.

I assembled everything and sure enough, like you said, it ran like a piece of s**t. Hard to start, impossible to needle. After checking everything over, I discovered that the center of the crankpin was .010" further back in the crankcase than the killer bee/other Bee cranks.

I can only conclude that the off centre thrust causes the lower rod bearing to bind on the crankpin. The additional side thrust on the piston probably doesn't help either. The answer would be to precision grind the front bearing face on the front of the crank web. I don't have the equipment for that type of operation. I give up – if my time was worth $5.00 per hour, I have spent $25 trying to make the Davis crank work. Bernie only charges $10 for a killer Bee crank.

You told me so.

Please stop laughing.

Regards, Kelley Crozier

The Trouble With Tanks

by Paul Gibeault

Cox engines fascinate me in that even today I have more questions than answers about them. For example concerning a Black Widow, when is a tank not a tank?? What I mean is they're all the same aren't they? One would think so by looking at them but I've found out very differently. Over the years while rebuilding (crash damaged or blown) engines, often the tank or tank back would need to be replaced. I was astonished to note that 1000's of RPM could come and go with different tanks and tank backs.
Due to my often unscientific methods of fixing mouse race motors, I'd tend to 'quarantine' certain parts that looked normal but were noticeably slower or down in RPM. Through trial bench running I would eventually find fast running replacement parts, but was never 100% sure why. Recently I was helping my racing buddy Les Akre tune his recently rebuilt motor for an upcoming race meet in California.

Some time ago Les acquired one of my mouse racers which has a particularly fast Cox engine on it. Fast to me is a flying lap time of 12 seconds for 5 laps using my Streaker design. In Les' hands this model has recently made the AMA Nats final twice while burning Sig Champion 35% nitro fuel.
Today was different though. The rebuilt engine (using a new stock Black Widow .082" venturi tank bowl & a new .082" metal backplate with a screen) only flew a steady 13 seconds for 5 laps, with a range of 44 laps. Only is an oxy-moron, as that's still going pretty well. Since Les had other tank bowls & backplates in his tool kit, we decided to play & see if we couldn't improve the performance.
This relatively 'high' lap range of 44 laps indicated that a smaller than optimal venturi was in use.

The second attempt using a drilled out to .089" tank bowl & a K/K .089" backplate (with fine thread NVA) yielded ~12.3 sec/5 laps. Fast, but the run was **quite unsteady** with a lot of variance. The backplate with the fine thread K/K needle valve assy, was noted to have a rather non linear needle, & therefore hard to set precisely. That meant turning the needle in say a 1/4 turn or more, the engine ran richer than previously. This particular unit needed several flights to nail down a "good" setting, which I found most annoying. This often indicates that particular needle may be slightly bent or possibly something else. It's tough to get stable results with funny running (or leaking) needle valves...so this is why the sealing of this item is important for competition race work.

The last test we did was to revert back to the stock .082" metal backplate, but this time with the screen removed. WOW, with the screen removed, lap times dropped to a steady 12.0-12.3 sec with 36 laps range.

The final combination settled on was a tank venturi hole of **.089"** & a tank back hole dia. of **.082" with no mesh screen.** This resulted in a pretty steady running model flying at 12 seconds flat, with a range of 36 laps with a maximum variance throughout the run of .3 sec. Variance meaning the fastest clocking was 12.0/5laps & the slowest was 12.3/5 laps.

SO! Now we've found out that the mesh screen effectively makes the engine "see" a smaller venturi than what the actual venturi hole would indicate. It also gives more range (run time) but less speed. It is astonishing to see how differences of just a few thousandths can be seen on the stopwatch. It is useful of course to have a **STEADY** pilot so that the stopwatch readings are not effected by whipping or flying style. For those of you fixated with RPM, I estimate that the difference between the starting & ending runs was perhaps 800 - 1,000 RPM. For a speed engine, RPM is useful, for a race engine lap time & steadiness are more important.

Photo is Paul Gibeault launching for Mariana Isidro in the Junior 1/2A Protospeed event. Santerem, Portugal Oct. 2012.

What's Up With Reeds...?

by Paul Gibeault

In the never-ending quest for reliability & performance, questions are often asked about reeds.

The earliest (copper beryllium) reeds actually work quite well. The only fault is that they are RPM limited to ~17,000 or so. Given that most reed valve motors (at the time) were not expected to go any faster, they were quite fine for the purpose & often gave a correspondingly longer engine run due to the lower RPM level. Other than that, the only other issue is that they could corrode if raw fuel was left on them for a long time. They also needed care during installation as any crease put into them would often make them run worse if at all. Some 'tuners' attempted to specifically crease the reed and/or use one & a half reeds (& other such combinations) to get past the 'reed-float condition which as stated occurred ~17,000 RPM. Results varied from somewhat better to much worse...

Later on, Cox developed the clear mylar reed in two shapes (cross & rectangular). I've used both interchangeably & can't find any noticeable difference. The cross shaped reeds were intended for the G-Clip installation,(Golden Bee) whereas the rectangular reeds were found in the later 'nylon cap holder'(Venom)type of installation.

At present there is no faster reed than the mylar type. (Good for 24,400 on my bench test circa 1995). The stainless steel reed is often no slower & possibly more damage tolerant than the plastic mylar reed. I have noticed that the steel reed does tend to wear off the color anodizing on the reed seat. Although I prefer not to see this condition, I cannot really say if it's anything to really worry about. Probably not. Some time ago I did receive some experimental (thin) steel reeds from Larry Renger to try out. There is a theoretical advantage to using a thinner material but my initial testing did not show a noticeable difference.

I had heard that a reed cut from 'floppy disc' material gave an increase, but it didn't show anything when I tried it. I also tried the DDD teflon reed & again it was no better & in some cases worse at least for glow fuel use. I've heard about one or two other reed types available, but have not tried them & so can't comment on their performance.

One VERY INTERESTING case came up when a customer returned his mouse engine (tuned by me) for examination. It had been a very nice running 19,500+ RPM engine when delivered (using a steel reed). When run again, it ran a very smooth but slow 18,500. HMmm! Where did that 1,000 rpm go I wondered? Well, after messing around with several different pistons I was only able to gain another +500 RPM. Bringing it up to 19,000 RPM, but still short of the original target RPM.

Then for some reason, I swapped the existing steel reed with a new mylar reed. Boom, 20,000 RPM steady! AHA, I found the problem. Previous testing showed no difference in RPM like this, so why the change I wondered? Under 10X magnification, I was able to determine that the steel reed had a tiny dent in it. Probably from ingesting a bit of sand or something... So my trouble shooting did the wrong thing for the right reason. I've now learned that slightly damaged reeds can cause quite a performance drop, although the 'steadiness' of the run is not affected.

In conclusion, this is why I've said that fast running reed engines need to be kept pristinely clean at all times. However, on the dirty/sandy flying field, this is not always possible. So I've now added to my "Trouble Shooting" check list of things that can go wrong, to swap reeds if all else looks OK. Who would have thought??

Reedies, you gotta love 'em!

Paul Gibeault (a.k.a. Mr. Mouse)

P.S. I have to thank fellow mouse racer Bob Christ from Arizona for bringing this to my attention.

Hi Guys! Just some more info I thought I'd pass on...Enjoy!

Here's an answer to the question: "I can't believe I paid $140 for a reed valve .049, how fast do they go?"

Yeah, $140 is unreal for a Cox! Of course...$20 was for Fedex delivery & if you ever go to Fedex, you'll KNOW that you just got a 75% DISCOUNT as the normal price is ~$80!! (Ask Phil Valente in Penn. he paid $95 to Fedex ship me his engines/parts initially PLUS paid a $15 customs charge!!)
So that leaves $120 for the actual engine....still outrageous, right? Subtract the Galbreath head ~$20... NONE of the 'bought engines' come with a TD piston/cyl ass'y. Oh, those can be bought too on Ebay for ~ $30-$40 each delivered. And those Ebay ones may OR MAY NOT be fast. If not fast enough, I gotta go into my own (dwindling) supply & come up with TD cylinders & pistons, that are fast. So that leaves ~$60-$65 for the actual engine.
Now knowing that I NEED at least 2 engines to build a "good fast one", well then that's ~$30/ engine. Hey, I can't even get a decent engine off Ebay for that price!
(Gotta including shipping, paypal fees, customs & taxes...)

OK, so now I've got the engines & parts. They all need to be dissasembled & cleaned. (That means I gotta buy scotchbrite & solvents, right?)

Alright, now comes the nitty-gritty. Firstly, all the pistons need a ball-socket re-set. (don't forget, $15 for the tool). Then the pistons are mixed & matched with (de-burred) cylinders until they "feel right". De-burring cylinders can *take awhile* trying to figure out exactly where the burr is causing friction, & then dremel grinding it away w/o screwing up the whole cylinder.
Some never feel right and are outright rejected & put in the junk drawer...(that's OK, I'll swallow that cost, too)
I use a bright light & magnification when looking at pistons & cylinders...
Then I polish the crank (if it's at all corroded) & sometimes the crankpin if necessary, again to remove trace corrosion which causes binding. The bottom end is then assembled & "spun tested" to ensure a good fit. Many don't spin free & then the mix & matching business starts ALL OVER AGAIN! After an hour I can usally come up with a 'good' bottom end...
(BTW, I bought 20 davis cranks at $20 a pop only to find out that they run slow, give very hard starting & are hard to needle. Looks like I'm stuck with $400 of losers....) P.S. All the glowing "write-ups" are *WRONG!!* *but of course NOBODY told me that...!*

Now to the tank. Other than being dirty, most are OK. Any used backplates are suspect for cracking. As you know, I bend my own hard pick up tubes & file them accordingly so they "just fit" into position & don't move around.

The odd 'bent needle valve tip' gets replaced here as well ($5). Now, with a few bucks for all new gaskets & seals, it all carefully goes together.
I oil it up & check for a healthy snap going over compression. So far so good. Now off to the garage for test running.

Initial runs are made with the standard RELIABLE ($13.00) Cox high comp head & Sig fuel that costs $18.50 a litre over here... (but don't worry, I won't charge you extra for that). If the first run goes well then I'll switch over to the Nelson/Galbreath head combo. Most often that gives between 100-800 more rpm. That's good! Sometimes that head combo causes a *loss* of several hundred rpm's & I have to shake my head & try to figure out why. Figuring our why involves (yet) another disassembly & most often a piston change. Then a re-assembly & re-test all over again. Serious performance problems mean even a third disassemby & even further checking... Some new backplates I've found, the NV either won't close enough OR won't draw fuel. That means yet another disassembly & part swap.

Do you happen to see a pattern here?

A pattern that as long as my precious time is *FREE* then basicly, I'm giving away the very best tested & matched engine parts & keeping all of the slow junk. (If you want slow junk, I've got lots of spares that can be used for that!!)
BUT, that's NOT what I advertized, was it??

My thought is that a 3:00 minute heat & a 6:00 final puts you in the "winners circle" (top 3) in 9 out of 10 mouse races that I read about...

OK then, so your question " how fast does it go?". My performance minimum is 19,000 RPM here in Leduc weather. West coast weather is faster.
Some engines according to my notes hit 20,000 RPM, which is about 800-1000 better than the standard.
Sometimes that happens...
With a Streaker, APC prop, Sig 35% fuel, good starts & pits, such an engine is capable of a heat in the 2:30's & a final a bit over 5 minutes. Now THAT'S '*smokin'*!
So there is where your money went.
A terrible investment & mother would never approve...
"...and now you know the rest of the story, I'm Paul Harvey...good day!"

p.s AND, don't forget, let that ball socket get too loose & your investment will die...

CONTEST CALENDAR

NOTE! Confirm all contest details with Contest Director!

NCLRA cannot be held responsible for errors or omissions! This calendar is compiled from data collected at the NCLRA website nclra.org. and other published sources. Members can log in to NCLRA.org and submit contest details.

NORTHEAST DISTRICT

South Jersey Aero Modelers 2016 Racing Schedule
Contest site: Mountain View Park, Middlesex, NJ
CD: Phil Valente.

NORTH CENTRAL DISTRICT

None

NORTHWEST DISTRICT

None

MIDWEST DISTRICT

None

SOUTHEAST DISTRICT

None

SOUTH CENTRAL DISTRICT

SOUTHWEST DISTRICT

Whittier Narrows Racing & Speed Calendar For 2016
Speed events include: Electric, 301-310 & 606-607, Perky, NASS Sport Jet, C-Speed.
Racing events include: S.C.A.R. Goodyear, NCLRA Clown (60 foot lines), Mouse Race, NCLRA Quickie Rat, and Super Slow Rat/Fox Race Speed flown both days.

Racing flown Sunday only except for the Virgil Wilbur Memorial.

December 3-4 Toys For Tots.
Whittier Narrows Park now charges $6.00 per weekend day entry fee! You can buy an annual pass from the bureaucrats at the Park Headquarters (weekdays only) for $25.00 if you are a member of one of the local clubs. All events are AMA sanctioned. Membership is available on site. All pitmen must wear protective headgear while racing or during practice. Before you set out on a cross-country trek, verify the event date and location have not changed.
Speed contacts: Howard Doering (714) 638-4937 Cell (714) 394-5304
Joe Brownlee (714) 895-1857 Cell (714) 393-1940
Jon DeFries (951) 315-3929
Racing contacts: Ron Duly (818) 843-174
Don Burke (714) 329-1457

NATIONAL RECORDS

SLOW RAT (.25 engine)
Op (70 laps) 3:01.52 Jim Gall/ Les Akre 7/04/11
(140 laps) 6:17.59 Russ Green/ Bill Lee 7/07/09
(no Jr or Sr record)

½ A MOUSE 1
Jr (50 Laps) 2:37.57 Scott Matson 7/15/99
(100 Laps) 5:17.68 Scott Matson 7/17/99
Sr (50 Laps) 2:44.68 Dave Rolley Jr 7/15/99
(100 Laps) 5:20.11 D.J. Parr 7/16/98
Op (50 Laps) 2:12.3 Jim Holland 7/16/04
(100 Laps) 4:22 Ryan & Gibeault 7/15/99

½ A MOUSE 2
Op (70 Laps) 3:01.24 MacCarthy/Kerr 7/11/03
(140 Laps) 6:18.13 Whitney/Hallas 7/10/09

SCALE RACING
Jr (70 Laps) 2:50.65 Bob Fogg III 7/16/91
(140 Laps) 6:08.55 Bob Fogg III 6/23/92
Sr (70 Laps) 3:15.12 Doug Short 7/11/00
(140 Laps) 5:40.05 Bob Fogg III 7/11/95
Op (70 Laps) 2:39.38 Willoughby/Oge 7/15/97
(140 Laps) 5:33.04 Bob Fogg Sr 7/16/91

F2C TEAM RACING
Op (100 Laps) 3:42 Fisher/Wilk 7/13/15
(200 Laps) 6:43.32 Fisher/Wilk 7/16/12

F2CN (NCLRA RULES)
100 Laps 4:14.84 Bill Lee/ Russ Green 7/07/11
200 Laps 8:37:10 Wallick/Brozo 7/15/13

NCLRA 'B" TEAM RACING
Op (35 Laps) 1:24.34 Burke/Duly 7/12/05
(70 Laps) 3:05.73 Green/Lee 7/10/09
(35+70 Laps) 4:33.91 Green/Lee 7/10/09
(140 Laps) 6:08.80 Green/Lee 7/10/09

RAT RACING (.15 RULE)
Op (70 Laps) 2:44.6 Jim Holland 7/15/04
(140 Laps) 5:33.1 Jim Holland 7/15/04
Jr-Sr No record established

NCLRA FOX RACE
Jr (100 Laps) 5:57.11 Scott Matson 7/11/99
Sr (100 Laps) 5:28.09 Scott Matson 7/16/02
Op (100 Laps) 5:32.55 Tim Stone/Bob Oge 7/10/05

NCLRA CLOWN RACE
Op (7 ½ Min.) 150 Laps Bischoff/ Lee 7/15/15
Op (15 Min.) 284 Laps Bischoff/Lee 7/15/15

NCLRA TEXAS QUICKIE RAT
Op (70 Laps) 2:58:72 Bill Lee/Bill Bischoff 7/18/13
(140 Laps) 6:07.01 John McCollum/Bill Lee 7/14/05

NCLRA SUPER SLOW RAT
(100 Laps) 5:14.30 Bill Lee/Russ Green 7/05/09

SUPPLIERS

BRODAK MANUFACTURING
Everything c/l! 100 Park Ave, Carmichaels PA,15320
724-966-2726 email flyin@brodak.com

CS ENGINES AMERICA
113 North Chase Ave., Bartlett, IL 60103
G/Z .049/.061 Engines; sales, service & parts. (Bill Hughes)
e-mail williamhughes4@comcast.net 630-736-6036

DARP
969 Cedar Street Allouez, MI 49805
DARP Speed Pans for classes including
A, B, D, and 21 Sport. (Barry Tippett)
e-mail: Barry@Petrockfarm.com 906-337-4533
www.Petrockfarm.com

JIM DUNKIN
Engine reference books 816-229-9671
dunkin@discovernet.com

ELIMINATOR PROPS
Steve Wilk 3257 Welcome Ave. N. Crystal, MN 55422
763-531-0604 e-mail swilk@cpinternet.com
Online store http://eliminatorprops.com/store/

STEVE EICHENBERGER
Custom Fiberglas Performance Props: Moulded tops. Steve Eichenberger 480-730-0016

GILLOTT RACING PRODUCTS
Custom engine reworking, hard chroming
Tim Gillott 1063 Harding St.
Salinas, CA,93906 Phone 831-449-2052

GOODYEAR PLANS- DOUG MEYER
Douglas Mayer 5010 W. 123rd Place
Hawthorne, CA 90250 310-676-4240 Home
310-463-0525 cell
mayer@kmd-arch.com

JUST ENGINES LTD
Newby Cross Farm,Newby Cross
Carlisle, CUMBRIA CA5 6JP England
Popular engines plus spares and Pipes.Irvine, Moki, Mvvs
(http://www.justengines.unseen.org)

JON FLETCHER
Custom replacement engine parts, needle valves.
33 Lagari Close, Wingham, NSW 2429
Australia Tel. 61 2 6553 4548

LEE MACHINE SHOP
827 SE 43rd Street
Topeka, Kansas 66609
785-266-7714 - Sales@LeeMachineShop.com
www.LeeMachineShop.com

RITCH'S BREW
Fuel ready mixed top quality finest ingredients.
4104 Lark Lane, Houston, TX 77025 713-661-5458

MBS MODEL SUPPLY
Solid Wire Sets and other C/L needs
Contact Melvin Schuette, PO Box 282 Auburn KS 66402
1-785-256-2583. mbsmodelsupply.com

MEJZLIK MODELLBAU
Borova 14, 64400 BRNO,Czech Republic Distributors of PROFI line of Russian FAI speed gear. PROFI Engines, Pipes, Pans, Props, Tanks, Handles and FAI Speed Models in kit form or ready built. (Tomas Mejzlik) Phone: 420-5-432-18888 Fax: 420-5-432-18880 e-mail mejzlik@brno.comp.cz

NELSON COMPETITION ENGINES
121 Pebble Creek Lane, Zelienople, PA 16063
Manufacturer of NELSON Racing Engines and parts, FAI Pans for F2A & FIC Custom Button Heads, Nelson Glow Plugs, many other specialty engine items. (Henry Nelson) Phone: (724) 538-5282 e-mail: nelcomp@fyi.net

MARC WARWASHANA
Rubber fastfills, vintage Dons' racing wheels.
11577 North Shore Dr.
Whitmore Lake, MI 48189-9124
Phone: 734-449-7355 E-Mail: whellieman@gmail.com

OLD MAGAZINE PLANS & MORE ON CD
Tom Wilk, 301 W. Redwing St.,Duluth, MN 55803
Phone: 218-724-0928(hm) E-Mail: tawilk36@cpinternet.com

ZALP ENGINES
Zalp F2C&F2D engines- Bob Whitney
456 Garvey rd sw, Palm Bay FL 32908
f2cracer@aol.com

BISCHOFF'S SPORTSMAN GOODYEAR RACING PARTS

ASP S15A engine **$65.00**
(also have one Magnum - your choice) New in Box. Includes stock muffler and carburetor. Requires venturi and needle valve assembly. (Add $20.00)

ASP/ Magnum 15 VENTURI **$10.00**
1/4" ID, 4mm spraybar, fits 10mm hole

RSM Supertigre style needle assembly **$10.00**

Aluminum landing gear struts **$12.00**
.090" 2024-T3, drilled & tapped, with screws
Edges pre-rounded.

wheels and axles **$6.00**
1 1/4" Williams Bros. wheels, 1/4" axles

1/4" axles w/o wheels **$2.00**
with hardware- requires 1/4" hole in wheels

1 oz fuel tank **$20.00**
per Margaret June plans

Bellcrank button kit **$2.00**
includes hex buttons, eyelets, screws

Fuel shutoff trigger wire **$1.00**
per Margaret June article

Fuel bottle fill fitting **$1.00**

Shipping $5.00 per order including engines / $5.00 per order including fuel tanks/ $3.00 per order without fuel tanks or engines. I accept paypal or personal checks.
Paypal: billbisch@hotmail.com/ mail checks to William Bischoff, 1809 Melody Ln, Garland TX 75042. For questions, call (972)840-2135 or email billbisch@hotmail.com

Officer's Addresses

President
Bill Bischoff
1809 Melody Ln
Garland, TX 75042
Phone Numbers:
972-840-2135
972-245-8379
Email: billbisch@hotmail.com

Vice- President
Les Akre
13336-129st.
Edmonton, Alberta T5L-1J8
Canada
Home: 780-454-5723
Cell(or other): 780-919-2792
E-Mail: scaleracer@hotmail.com

Secty/Treas
Melvin Schuette
P. O Box 240
Auburn, KS 66402
Home: 785-256-2583
Work: 785-221-7042
Cell(or other): 785-221-7042
E-Mail: mbschuette@cox.net

Editor
Les Akre
13336-129st.
Edmonton, Alberta T5L-1J8
Canada
Home: 780-454-5723
Cell(or other): 780-919-2792
E-Mail: scaleracer@hotmail.com

North West Representative
(none)

North Central Representative
Steve Wilk
3257 Welcome Ave. N.
Crystal, MN 55422
Home: 763-531-0604
Cell: 763-257-3588
E-Mail: swilk117@yahoo.com

North East Representative
Phil Valente
1523 Ulster Way
West Chester, PA 19380
Home: 610-692-6469
E-Mail: phil_valente@millipore.com

Midwest Representative
Robert Heywood
1267 Old Country Drive
Dayton, OH 45414-1918
Phone Numbers:
937-890-7555
937-286-8202
Email:rheywood@woh.rr.com

South West Representative
Ron Duly
1806 Karen St.
Burbank, CA 91504
Home 818-843-1748
Email: rduly@earthlink.net

South Central Representative
Bill Bischoff
1809 Melody Ln
Garland, TX 75042
Phone Numbers:
972-840-2135
972-245-8379
Email: billbisch@hotmail.com

South East Representative
Jim Bradley
1337 Pine Sap Court
Orlando, FL 32825
Home: 407-277-9132
BMP4CARBON@aol.com

Torque Roll is the official publication of the NCLRA. Published bi-monthly. All submissions are valuable & will be considered for publication subject to editing. Preferred format for publication is as a MS Word document using 10 point Times New Roman font. Any photos should be sent as a separate jpeg file, medium res. Email all as an attachment to Les Akre at the address given on this page.

NCLRA membership information
Basic membership is free. Simply apply on the web site : http://www.NCLRA.org/ You will get the Torque Roll newsletter electronically every other month. In addition, you will get voting privileges for whenever a vote by the membership is required.

If you would like to receive a paper newsletter
A paper copy subscription is $10.00 for US and non-US residents. Send payment to the Secretary/Treasurer listed above.

USING PAYPAL-To pay with Paypal, first log in to your Paypal account, then send the paper subscription fee to; Treasurer@NCLRA.org

Note that a $.90 ($1.10 for foreign membership) surcharge is added for the PayPal charges.