Technical tips

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"post flight" checks. The engine vibrates a lot of things loose. A post flight check might just insure your next flight. In as much as you will not arrive to your field without the necessary parts or tools

Tuning

The Low/med RPM jet is the plain black adjustment screw.

The "Idle Stop Screw" is the conical-shaped screw. It does not directly operate any jet aperture; it does NOT "adjust the idle mixture" as a needle jet does, it adjusts idle RPM by only opening/closing slightly the throttle butterfly.

My max revs are only 8200, I was expecting 9500+ but there is no increase in rpm over the last 1/3 to 1/4 throttle opening! I am told that this is a sign of it being too lean? I have changed both diaphragms & blown out the carb with an air line but to no avail.
Words form experience:Take off air filter. Verify that the choke valve fully opens. Test-run the engine without the air filter.
In my case both were culprits to 8200 RPM. After some adjustments I get9000+ @ WOT.

Re: Poor max RPM
1) If engine hesitates when opening the throttle, it is running rich. (Damned fixed jets!) Calibrate pop-off pressure as it also helps verify you have no leaks in the metering needle seat.

2) A used engine may have low compression due to leaks; decarbonize cylinder and decompression valve and while you are at it, change the two piston rings.

3) Get a new exhaust gasket and tight it well. It has to sit perfectly.

In the mean time, BEFORE each flight, run the engine by ear at about 2/5 the total speed (3500 RPM) and slowly adjust the straight screw (low speed jet screw) until the engine hums nice and does not hesitate when aplying power. Then adjust the conical-head screw (idle screw) so that the engine keeps running without spinning the prop but without stalling (about 2600 RPM). Need about 1/8 of a turn, no more.

In cold air you´re geting more air in through the carb and into the cylinder, since the colder air is also denser air, equivalent to being at a lower altitude. Since your carb´s settings will not have changed, you´re effectively running a leaner mixture that will burn more efficiently giving you more power, thus more rpm. The down side is the motor will be running hotter, check your spark plug after letting the motor run to full operating temp and you´ll notice the difference. All this is good stuff as long as it´s not overdone, then you get an engine seizure. On carbs with separate high and low adjustment screws, the high needs to be adjusted to max rpm at full throttle (leanest mixture) and then backed off about 200-300 rpm (richer) to avoid seizure. If you were already running a lean enough mix (light brown plug) watch out.

I need to know all the possible reasons for the over heating.
I asked some 2 stroks guys and they said that may be there is some air leak from the crankcase or from the fuel(hidden) high jet needle in the carburator.Easier options are the spark plug, bad oil mixture or bad oil at all but I made no change in those factors.

The average rpm range for NRG with the new type of carbon prop varies quite a bit 8100-8700 between different motors. This prop has quite a heavy profile and pitch loading the engine at much lower rpm. There is no fault with you Tiny Tach it's the combination and setup. You will also notice a difference rpm from colder engine to warm engine dropping 200-300 rpms after around 30 seconds into a climbout. This is the nature of the exhaust design and can only be rectified by changing the exhaust design.

On the WASP we see an increase of rpm when the engine is hot compared to a colder one because of exhaust gas temperature being consistant.

Your idle rpm seem a bit high thaugh, you can tune it now using you Tiny Tach to bring the idle down to 1800.

Some knowledge of setting the carburettor is needed, too lean a mixture can cause difficulty in starting and getting the engine to continue to run. After starting the engine and warming it up slightly a lean mixture may be indicated if when throttling the engine a throaty sound is emitted before the engine picks up speed. In bad cases the engine may stop abruptly after firing just a couple of times, choking the engine again, the engine fires, remove the choke and the same thing happens again. It is surprising how many pilots I have come across who were pulling over and over again with the engine giving short burps and stopping and all they needed to do was turn the slow running screw just a fraction more open. Check the low speed needle valve setting, this is recommended to be one turn open from fully screwed in, too rich is just as bad as too lean I find that my engine starts much more easily if the setting is about one and one eighth turns out.

I have heard of engines with seized piston rings due to carbon deposits after only a short period of engine run time. Get the engine checked for any problems here

With the air density changes in winter you may need to have the mixture screw further out to richen the tickover mixture - try 1 1/2 turns out, it is usually 1 1/4 turns, but can vary between engines. A too weak mixture is hard to start, a too rich mixture can run rough when slow.

Walbro Carb VG32<http://aerocorsair.com/id27.htm> > Carburetors NB not the WG^ that is on the radne <http://www.walbro.com/>

Answering your question about the "flat spot" or "hole" as you call it, this effect is caused by a faulty carburetor setting.
Please visit my web site www.aerocorsair.com and look up my article: "Tuning a diaphragm carburetor" This article is also published on the Technical Info page of www.poweredparaglider.com
All the tuning should be done with the engine running. In my article I describe how to do it and if you follow my method, the engine itself will tell you what HI and Lo settings you need.

Also, if you have a Walbro 32 carburetor on your Cors-Air, please be advised that it is a very peculiar one. This is why I built an In-flight carburetor adjustment system which allows me to tune the carb in flight. The article can be found on the Inventions Page of www.aerocorsair.com or on the Technical Info page of the www.poweredparaglider.com

The following URL's provide a great deal more information on the Waldro carburetor and will help you better understand how the thing works. As it serves as the fuel pump and the carburetor, it is a little more complex than most carburetors. To accommodate the fuel pumping operation, there are three check valve assemblies included in it. Because the incorporated pump is a diaphragm positive displacement pump, its pumping action does not produce a smooth flow of the fuel - it pulsating flow, starting and stopping with each stroke of the diaphragm pump. This pulsating action in itself causes fuel vaporization and especially so with today's environmentally sensitive gasoline formulations. My experiences with this type of pump has always had a pulsation dampener incorporated into the plumbing or pumping system to smooth out the pulses. Note there is no pulsation dampener in the Walbro design.

Bleeding Walbro = On the underside of the carb in the middle of the diaphragm plate there is a hole. Some manufacturers of FLPHG add a bleed nipple for easy bleeding, however, if yours does not posses this then the nib of a pen will do... do not use anything sharp and pointy as this has been found to damage the diaphragm itself. Keeping the fuel tank lower than the carb will allow the air to be expelled as you depress the button and pressurise the tank ... I suspect that if you have not been doing this, that this may well be the source of all your problems. the mechanism by which air exits the Carb. Look again at the diagram!!! It clearly shows that the air vents through into either the inlet or outlet of the Carb via the low speed needle valve or high speed needle valve and not out through the hole in the bottom. When you depress the diaphragm fuel will eventually flow into the carburetor barrel and out the air cleaner onto the ground. It is much like bleeding brakes. If you hear a farting sound as you squeeze the bulb and drain the carb, then there is air in there.

Visually, one can see the line fill (providing you use clear fuel line) and you can also hear the flow out from the carb as it fills.

We have made a 'fix' for the frothing Walbro by introducing a 3mm internal bore ally tube of 100mm length into the fuel line just before the carb. This stops the tiny air bubbles migrating and collecting at the high point of the fuel line and eliminates the temporary power loss at full power. I must add that this is a fix for the carb frothing and will not fix any air leaks within the fuel system or a poorly primed fuel line.

Here's a suggestion for a simple experiment and possible cure for bubble sufferers. I am assuming, that unlike mine, the fuel lines run down to the carbs on your inverted engines. Now add a couple of feet to your fuel line and let it emerge from the carb and then hang below the engine . Now run it to see if you get bubbles. Hopefully the bubbles form close to the carb and go immediately where the sun don't shine. You can now lift the tube slowly to see if any form further out from the carb. If so this is then the lowest point of the bend. With a bit of luck one can make a neat loop below the engine before routing as normal. If it works you probably don't need no restriction tubes to speed up flow. Maybe those lost revs will re-appear if they ever disappeared. Patrick -Interesting idea. I had considered this idea but was concerned that the fuel line might run too close to the head and would overheat the fuel causing greater chance of vapor lock or melted fuel line.

You might consider the following parts:

1) 1/8" urethane primer line. Part #8615. Sells for .45 cents/foot. This is a thick walled urethane that will not kink around corners like most small diameter tubing will . It will also not collapse under vacuum according to the catalog. This fuel line has a blue tint to it but it is clear enough to detect air/vapor bubbles. Obviously do not use any tubing that is not specifically rated for fuel.

2) Carb Access fitting. Part#8617. I found it very difficult to remove the white plastic barb which appears to press on the brass carb fuel inlet. According to radne, the white plastic can be removed exposing the brass and the the carb inlet will then accommodate the 1/8" tubing. If you don't lose that white plastic you will never get that 1/8" fuel line on. I broke off the inlet so I tapped the carb at the old inlet location and threaded this part (8617) into the carb. Used a little locktite to make sure it never worked loose. If you have to tap that inlet as I did, remove the access panel from the carb so you can make sure no metal from the drilling process finds its way into the carb. You may want to spray the area with carb cleaner to make sure you get all the small pieces.

Radne: The problem you describe with the power lose at take up is very easy to fix. If you change the fuel line from 6 mm to 3 mm, you will solve this problem. On the fuel connection at the carburettor there is a white bushing take away this bushing and the connection is for a 3 mm fuel line. And your problem is solved.

This is a safety bulletin to all Bug owners and to all owners of Radne Raket 120s with 6mm (1/4")fuel lines.

Radne fit a white plastic adaptor to the Walbro carburettors which allows a 6mm bore fuel line to be fitted. It seems that this adaptor is responsible for the majority of cases where air bubbles appear in the fuel line.

Flylight recommend that you remove this white plastic adaptor on the carburettor and use the 3mm (1/8") brass tube that is underneath the adaptor and replace the last 600mm (2 feet) of fuel line with 3mm (1/8") bore fuel line.

to remove the plastic adaptor, use a sharp Stanley or razor blade to shave the plastic of one side revealing the brass tube underneath, then pull the remainder off with a pair of pliers, grips. Take special care not to score or damage the brass tube. The plastic is relatively brittle and will crack away from the tube fairly easily.

Change at least the last 2 feet of 6mm (1/4") fuel line with 3mm (1/8th) fuel line, use a 6mm (1/4") to 3mm (1/8") adaptor/reducer to go between the 6mm fuel line and the new 3mm fuel line, push the 3mm (1/8") fuel line onto the brass feed tube into the carburettor. Use a double loop of safety wire to clamp the 3mm fuel line on to the brass tube and the adaptor/reducer, use the old 6mm clamp for the 6mm fuel line on the adaptor/reducer.

Ground run the engine to check that the fuel line is full of fuel, use as normal.

We have a fuel line modification kit available and will happily send these on to any one who is interested, the cost for the kit is £5:00 or $9:00 plus postage / shipping. Kit includes: Instructions, length of 3mm bore fuel line, 6mm / 3mm reducer, lock wire clamps and jubilee clamps.

I recommend that all Bug owners and other unit owners with the plastic adaptor fit this modification. The results are fantastic with no air in the fuel lines and no power fades during full power and mid power ranges.

I have to confess that I would never have suspected the adaptor if it was not for Mike Schols who, fearing that the seal was not as good as it should be, squeezed bathroom sealant around the adaptor, carb and fuel line. His air bubbles disappeared. Thanks Mike for solving one of the foot launchers greatest mysteries, your a star.

The speeding up when choked is a sure sign that there is still an air leak (or the fuel pump is weak). R. Williams ----- Original Message ----- My trusty beast has been playing up. Started with it dying at idle and sometimes missing at high speed after launch. It then progressed to starting only with a jolly good priming and the choke on and it would run just fine until the prime run out. It would not start with the choke off but would run at higher than 1/3 revs quite smoothly if the choke was opened quickly when running. I noticed air bubbles in the in-line fuel filter so I replaced both diaphragms (reused ones recently replaced), stripped the carb and cleaned the gauze screen, checked the needle valve (o.k.), and blew air thru any orifice I could find (a common hangie pilot trait). Also checked the integrity of the fuel line joints. After I re-assembled the whole deal and played with the low speed mixture and idle settings it run a whole lot better and does idle though fluctuates some (read not as smooth as it was new). It is nice and snappy with a healthy dose of throttle off idle, but, as you kill the engine via the choke (Explorer harness) it speeds up before it dies. Never used to be like that either. I'm puzzled and looking for clues. The motor is 65 hours old. As an aside I recently needed to

replace the springs that engage the starter pawls, the just wore out and broke with the vibes. check em out for fear that they let you down.

While I don't necessarily tweak my carb everytime I go out to fly I do keep an eye on the plug color on a regular basis to note any changes. Based on the information provided by the individual who burned a hole in his piston I would say that his mixture was extremely lean. It could be from setting the high speed needle too lean or from an air leak. Air leaks can lean your mixture out with exactly these results. Having worked on many a two stroke engine, the first thing I do if someone comes to me with a failure like this is to check the engine for air leaks. Only then do I do any kind of disassembly. One other thing that bears repeating is that there are two kinds of "mixtures". First is the fuel/oil mixture and second is the air/fuel mixture. Either one being leaner than it should be can hurt. I am sure you know all this but I am repeating it for some of those that may not. I am not familiar with the exact setup on the Radne but, do not confuse the high speed jet with the high speed needle. The needle is almost always adjustable so as to set the high speed mixture.

1. You can't see the high jet needle and if you will find it some day, just don't touch it. 2. There are two black needles, one is conical and the other one. 3. The conical is not so important, yet, but the other one is for low speed and it is important. The best for it is one turn from close position, then, when the engine is on, you can play with to get the idle (or more). 4. The conical is to stuck the throttle "no less than..." but you can close it.

The rings were free and clear on both grooves, and there was no scuffing on the skirt. Likewise, the skirt did not show any of the characteristic smoky markings of fuel with too little or no oil in the mix. It did not seize, and there was oil in the mix. Holed pistons are indicative of detonation, or serious pre-ignition. In my experience (about 20 years of playing with and tuning engines), there are five ways to get an engine to detonate or pre-ignite that badly: 1.) Raise the compression via modification (not a factor in this case). 2.) Advance the ignition beyond the safe level allowed by fuel quality (the Radne ignition plate fixes the timing advance unless modified - again not a factor on this engine). Some times we advance ignitions to try to get more efficient burns at higher RPM. As you advance the ignition it begins to run so nicely, and then you advance just a degree too far, and BLAM! 3.) Run a plug too hot by (A) running too high a heat range, or (B) running too long an electrode, so that it emerges further out of the head. A hot running plug raises the effective compression ration slightly, and can allow Diesel cycle pre-ignition of the compressed mix before the plug actually fires. 4.) Lug the engine by badly overpropping it, in combination with 1, 2 and 3 above. 5.) Run bad fuel with an octane rating too low for the engine. Number five is where I put my bet on why the engine blew up

Carburettor trivia: I contacted the American distributor of Walboro Carburettors: Mr Luis Salas [Lsalas @ Walbro. com]; the 2002 RADNE 120cc manual erroneously identifies the carburettor as type VG6, he said Walboro never made a VG6, that it must be their WG6: http://www.walbro.com/lt has now been renamed WG8

1- Flushing the fuel line
2- Priming the carb
3- Pop-off pressure

1- Replace the rear portion of the fuel line (from the fuel filter to the carb) with a TRANSPARENT fuel line to aid with visual inspections. Make sure you DO NOT make a loop with the fuel line at any point! If air bubbles are present within the line, they will accumulate there and will promote an air lock. Air locks are undesirable. Take the opportunity here to change the fuel filter! Cut the fuel line where it passes below the belt & wheel and place a plastic T-valve with a 2.5" drain hose pointing down between the landing gear strings.

Fasten all fuel line sections with nylon cable ties and make sure you pull HARD with pliers when tightening them. Remember you want to keep the fuel in and the air out.

Place the fuel tank on the ground next to the harness and plug the fuel line into it (the gas tank being lower that the carb so bubbles will rise toward the T-valve drain. Open the T-valve drain you just installed and squeeze the fuel bulb at least five times and until you see no more bubbles in the fuel line.

The fuel line is 98% flushed. Now let's clear the last section between the T-valve and carburetor:

3 - Priming the carburetor:

Below the carb (WG8) there is a thingie that can be pushed to prime the carb. It is called the "metering diaphragm" (unrelated to the "pump diaphragm") and has other functions aside of helping you prime the carb. Push it GENTLY WITH A FINGER and simultaneously squeeze again the fuel bulb until fuel drips down from the carburetor's air filter and the last few air bubbles are expelled.

Note 1: Do not use a key or a screw driver to push this membrane. You may puncture it and/or you may shrink the important spring below (metering spring).

Note 2: When the T-valve is open, DO NOT squeeze the bulb too hard as high fuel pressure may damage the carburetor's metering diaphragm.

Check the transparent section of the fuel line for bubbles. DO NOT RELY on the carburetor to flush out remnant air bubbles without loss of power! You may want to repeat Flushing and Priming to ensure no air bubbles are left. Clear prop. Start the engine. After warm- up, proceed to mount the fuel tank WITHOUT unplugging it from the fuel line.

3 – Metering System.
Here something must be said about metering system and its calibration as it relate to air bubbles. Don't flinch, it is really simple, specially if you read the web links below.

In a nutshell, the metering system "meters" or has a calculated response to atmospheric pressure, venturi pressure and fuel pump pressure in order to deliver the right amount of fuel to the (fixed)

high-speed jet nozzle. It also allows for fuel delivery in any attitude or position.

When you push the carb's "thingie" (metering diaphragm) to prime it, what actually happens inside is that you are pushing on the metering diaphragm & spring, which raise the metering arm (also called fulcrum arm) which pull open the metering needle. Fuel rushes in from the fuel line through the pump, into the metering chamber and out thrugh the hi-speed jet nozzle.

Case study 1:
Your FLPHG is all set up and parked minding its own business but IF the fuel tank is placed BELOW the carb level and IF the pop-off pressure is waaaaay too low, the metering needle will not be seated properly and may allow AIR to flow through the carburetor INTO THE FUEL LINE. Purge & prime before every flight.

Case study 2:
Your FLPHG is all set up and parked minding its own business when all of a sudden you notice fuel driping from the bottom of the carburetor. You get closer and you see it is from the metering diaphragm. You ripped it because you used your idle screwdriver instead of your gentle finger when priming the carb.

Bonus Case study 3:
Your FLPHG is all set up and parked minding its own business when all of a sudden you see fuel persistently dripping from the carburetor's air filter.
That means that the metering needle is not in its normal -closed- position. Gravity pulled the needle down opening the inlet and it is siphoning the fuel. (IF the engine was mounted upright, it could siphon the fuel through the carb and into the crank case!)

Probable causes and fix:

Damaged metering needle or seat. Replace & calibrate pop-off pressure.

Dirt in the metering needle seat. Clean & calibrate pop-off pressure.

The metering spring shrunk because you keep on using that dammed screwdriver to push the diaphragm and purge the carb.
Fix: Gently extend spring or replace and calibrate pop-off pressure.
And from now on think of the fragile metering diaphragm as if it was your scrotum (you want poetry or advice?)

Metering arm (fulcrum arm) is bent. Straighten to 1 mm below carb line (without gasket) and calibrate pop-off pressure.

The last time you cleaned the carburetor may have forgotten to clip on the arm to either the needle or diaphragm. Dismantle and mount correctly. Calibrate pop-off pressure.

A Combination of the above. Calibrate pop-off pressure (see web links below).

Bonus Case study 4:
If it ain't broken, don't mess with it!

Some good articles are listed below. A Google search can bring up many more:

Pop-off pressure adjustments http://www.aerocorsair.com/id28.htm

Choosing the Ideal Carb & Pop-Off Pressure http://www.shark-racing.com/ingles/tecnica/escolhercarbing.htm

Servicing the Metering Mechanism http://www.kart-racer.co.uk/kart-books/tkm/07-Carb/Carb6.html

Checking the Pop-Off http://www.kart-racer.co.uk/kart-books/tkm/07-Carb/Carb7.html

"Most common cause of carburetor problems:
Dirt is the most common cause of carburetor problems. When servicing your Walbro carburetor, be sure to check the inlet needle tip area as well as the low and high-speed adjustment needle tips for dirt. Compressed air is the best method to clean those areas without leaving fibers from commonly used items such as a cotton swab and pipe cleaner."

Pressure Testing
Pressure testing a Walbro carburetor is an excellent way to determine if there is a possible leak in the inlet needle and seat area. Walbro diaphragm carburetors have a pop off pressure range between 10 – 16 psi. The range is due to variations in the metering spring, inlet needle, and seat combination. The reseat pressure should be no lower than 5 psi. The easiest way to pressure test a Walbro carburetor is while the carburetor is still on the engine. Simply remove the fuel supply line and attach the Walbro pressure tester onto the carburetor inlet fitting. Walbro's pressure tester part numbers are - 57-11 (0 - 60 psi) and 57-21 (0 – 15 psi) for float feed carburetors.

Diaphragm carburetor metering lever height
The height of the metering lever on a diaphragm carburetor is very critical. A metering lever set too high may create an over rich condition. While a metering lever set too low may create a lean condition. The correct procedure to set a metering lever is to use a Walbro metering lever gauge (part number 500-13). Apply light pressure with a small screwdriver to the head of the inlet needle to keep it stable. Lift or lower the opposite end of the metering lever, run the 500-13 gauge across the lever so that the lever moves slightly, but does not restrict the gauge from moving across it. Each Walbro carburetor is clearly stamped on the metering lever gauge.

Carburetor will perform next season
The best way to assure your Walbro carburetor will perform acceptably next season is to run the unit completely out of fuel. This will help to assure that the rubber components are not harmed by sour gas or that deposits don't form in critical fuel passages of the carburetor.

I replaced its cable "pushing" spring for a "pulling" spring. I loaded some photos on a geocities web page:
http://www.geocities.com/farellus/Explorer_Modifications.html

ter the fuel has passed the pump it reaches the inlet valve (a.k.a. inlet needle valve). The normal position for the valve is closed. The valve can be opened only if the main diaphragm is pressing down the lever. It is the amount of fuel in the main chamber that makes the main diaphragm move. When the valve is open, the fuel will flow into

the main fuel chamber of the carburetor.

From the main chamber the fuel can flow into the venturi of the carburettor through two jets.
If you have the WG8 (= WG6) carb, the high speed jet is fixed and itcontrols the flow of fuel at high speed. The size of this jet is factory set and can't be changed.

The second jet is adjustable, it is a needle valve. It controls the flow of fuel at low speed. The normal setting of this needle valve is one turn open from its closed position. Later you may open it a little further to make your engine run a little richer, or close it to make the engine run leaner.

For smoother and slower idle RPM refer to this modification:
http://www.geocities.com/farellus/idle_adaptation.html

If your problem is electrical and inconsistent, first calibrate the plug's gap to 0.4mm

Just one point, the two jet
> screws on my carb are described in my manual as a Main Jet and an
> Idle screw. The manual calls for the Main to be between 1 and 7/8
> turns out and the Idle screw 3 to 4 turns out. That seems to be
> different from Gerry's advice.
>

You may have a different carb. Take a real close look at those two screws. If one of them has a cone shaped section, and the throttle linkage touches the cone at idle, then that is your idle speed screw. By turning it the linkage hits the cone at a higher or lower diameter, thus changing the speed. The other screw will then be the idle mixture.

If you do not have the screw with the cone-shaped section, then you likely have a different carb. If you *do* have the cone-shaped section, I am guessing what they are calling the "main" is the idle mixture jet, and the "idle" screw is the speed.

The high speed jet is fixed (look inside the carb's throat and look for a small copper cylinder sticking out)

The "Main jet" is the adjustable Low speed jet.

The "Idle Screw" (aka: Idle stop screw) does not control the jets, it partialy opens the throttle butterfly to let more air in. I don't believe a Walbro carb can be functional at 3-4 turns open.

Whatever the carb you have, clean it. That's 95% the battle. Disasemble and clean each half at the time and make sure you clip the metering lever back into the metering membrane!

The carb model should be stamped on the carburetor's body. Take a look and let us know. (it may start with WA... or WG... or WB...)

Your high speed jet has little influence on idle RPM and engine starting. But if your high speed jet is adjustable, open it 1/2 turn to beguin with.

LOW POWER

Most likely there is a deficient fuel supply to the combustion chamber.

I know you have a transparent fuel line so you obviously have watched for bubbles. Replace the carburetor gaskets and valves (there are kits for the WG8 carb and I can guide you through carb maintenance) and calibrate the the pop-off pressure. The carb has an internal filter mesh and small passages that can cut power significantly at higher RPM demand).

After the carb is serviced adequately, I'd look into the compression:
A) If piston and piston rings are actualy OK, check for deep groves in the cylinder lumen surface (you burned ring may have done some damage to the cylinder).

B) The engine and carb work on a complex balance of internal oscilating pressures. I don't know the cylinder pressure value but to trace a pressure leak, connect a high pressure air hose into the spark plug hole (doesn't have to be air tight, hold with a rag and a plastic bag) and spray soapy water on the outside of the cylinder gasket area, decompressor (did you replace it correctly? Is it stuck OPEN?) and spray all other engine joints. Have somebody spin the flywheel and keep looking for bubles.

Note: The cylinder gasquet has to be NEW and both surfaces perfectly clean. You may want to apply a "gasket seal" substance when re-mounting the cylinder. Don't be intimidated, it comes out with only 4 screws and little can go wrong.

Two stroke engines are temperamental and sometimes you have to discover your engine's best startup procedure. Try different sequences. When flooded, remove the spark plug, (calibrate its gap, by the way) and dry it well. When I have flooding problems I do not open the choke for more than 2 pulls.
Walbro's take: "Dirt is the most common cause of carburetor problems. When servicing your Walbro carburetor, be sure to check the inlet needle tip area as well as the low-speed adjustment needle tip for dirt. Compressed air is the best method to clean those areas without leaving fibers from commonly used items such as a cotton swab and pipe cleaner."

Also, when mounting the carb's metering diaphragm, you have to ensure that the metering lever slides into the diaphragm's groove and the valve's groove because if the metering valve remains open if can cause a continuous fuel flow.

I have spoken to Walbro service reps, the WG6 does not exist any more, the Radne Racket uses the WG8 but the current engine manual was not updated on that point. I recon that maybe some early Mosquitos must have had the WG6. Most of us have the WG8. Look at your carb, it is clearly stamped on it.

Time and atmospheric conditions will harden and shrink the diaphragm that opens the needle valve. This will cause the needle valve to open and spill excessive fill. Usually you will find fuel dripping beneath the crab, if this is your problem. I find that adjusting the lever height is better than messing with the spring. -----Well said! The spring has a set K-value (force) you don't want to
mess with. And that's when the "pop off" pressure calibration of the metering system comes in handy

Exhaust

Regarding the paint, I still have to find ot what to use that will stand and EGT of at least 1200 F (649 C). For now, I just spray it with a thin layer of oil for storage.
No powder coat is good for exhaust temps. It's a plastic. Exhaust is
like 1300F next to the manifold.

There are now some "high heat" canned spray paints at the auto parts stores which are good for exhaust manifolds. Colors are limited and I think it lasts a couple of years or so.

The stuff the pros use is "ceramic paint". It's usually silver, very hard, lasts forever. A bit hard to get ahold of. It must be baked on
in an oven, and unfortunately the engine heat is too hot on one end and
too cold on the other to bake it on by just running the engine. I believe a kitchen oven can do it but you make want to think about if this is something you want to do with the oven you're about to cook dinner in.

Regarding the silencer, It is shameful they welded it together to the exhaust. I know what I have to do to fix it but I have damaged too many things in the past trying to weld so I did not operate on it. Anyway, the point is to dampen the vibrations or the exhaust will crack.

> > I'm not sure I understand the advice 'Mount it with rubber mounts' - do > you mean have a rubber connection where you hang it from the prop shaft > or somewhere else?

Yes. On one end the exhaust already has a "ball joint" with springs but the other end should not be bolted straight to the frame, here you should use a rubber mount that will absorb and dampen the vibrations. I used the original Explorer mount clamped to the shaft. The exhaust unit should be a bit loose but well secured.

Regarding the narrow silencer nossle, again I can't weld a bigger one in place, so I only drilled a few holes on the silencer cap next to the exhaust nossle. I have not taken temperatures yet but I strongly suspect it runs cooler now.

> >Aligning the pipe with the port is clear, but what else, if anything, > needs to be done?

Align the exhaust GASKET and grind it inside if necesary. Any obstruction inside the exhaust port will cost you horsepower.

One last post about stinger (tail pipe) and silencer:

Length of tail pipe (stinger) = Length of convergent tail cone.

Silencer's anulus diameter should be 2.5X diameter of stinger so that there is a gas pressure of no more than 1.1 Atmospheres at the exit

point.

I had the same problem with vibrations with the silencer after some time of high revs flight when an ultralight pilot suggest to use some high temp graphite grease around the connection point of the manifolt with the expansion champer of the exhaust(under the springs) That seems to work until now..

Springs

Silicone Tile and Bathroom sealant or the stuff you fix the roof with
I hope this explains what a "bead" of silicone is.Hold the nozzle on the spring and squeeze the trigger whilst moving the nozzle along the springs length, you should have encased the length of the spring with a bead approxx 1/4 " in width.

Springs should be individually wire locked - not all relying on the same piece threaded thru as Pete did. This prevents all springs being un safe in the event of a wire failure. The wire should be looped thru the centre of the spring and twisted together with proper wire locking pliers. This should then reduce relative movement at the securing points and prevent / prolong time to breakage due to chafing. The locking wire must be slack between anchor points, very slack, otherwise as the exhaust moves the wire will go tight and break. Adding extra springs may not be the solution. It may be better to just have the springs on the neutral axis of the expected movement of the exhaust to reduce stress. We have also found in microlighting that out of balance props, hard engine or exhaust mounts, rough running engines etc all contribute to these sorts of problems. Pre flight inspections of these areas are a must. If you have made any changes then don't go off on a long motorised cross country - try a few short flights first and check how your mod is doing to prove all is ok.

Do not use pliers to pull the end hook of the spring onto the attachment point. This can damage the spring hook, use a loop of cord or the round shank of a screw driver to insert through the hook and then pull the spring hook onto the attachment point.

Safety Notice. This applies to all Radne powered harnesses. There have been a few cases of repeated exhaust spring failures, this may be due to the exhaust spring attachment flange and exhaust manifold spring attachment flange. If the spring rests on the sharp edge of the flange, this may act as a stress raiser and cause premature failure of the spring. To stop this happening, simply bend the flange slightly in the direction of the spring so that the spring hook is more evenly supported, see illustration. Lastly, we have had one account of a spring detaching and hitting the propellor and then flying through the sail of the wing, creating a largish rip. The pilot had fitted the exhaust and the springs himself. All springs will fail, there is not an exhaust spring that won't. To stop the remnants of the spring going through the

propellor it has to be correctly wire locked. The wire lock should run through the same attachment point for one end of the spring, through the centre of the spring and to the other end's attachment point. The wire should not be taught but have enough slack to allow for flex and shock expantion. 10mm longer than the distance from one end of the spring to the other should do it. Exhaust springs need to be checked before every flight as even with them correctly wired, a spring failure will create an exhaust leak and may cause overheating and certainly a loss of power.

Each spring was safety wired through the centre of the spring and looped through the next spring due to the possibility of shear of the spring hook and safety wire in the same hole of the flange. 20mm spare (minimum slack) was available for each loop. Due to an undesirable and repeat spring failures, 5 springs were mounted on the my exhaust. The 6th hole on the exhaust was dedicated to the steel wire cable loop attaching the exhaust manifold strut to the engine as received from the "manufacturer". The flexible (spiral) portion of exhaust between exhaust manifold and exhaust was sealed with an exhaust sealant by myself to prevent exhaust leakage. My previous experience showed that flexible spiral spacer had contracted shrunk and expanded with use. The seating of the flexible coil to the exhaust manifold and exhaust chamber sleeve allowed exhaust gases to exit prematurely. I could reasonably assume some for loss of power but more importantly, a high heat source escaping directly at the section where the springs and safety wires lay. Yes, the flanges on the manifold and exhaust chamber are manufactured with a higher tensile but have a sharp contact with the spring hook which would contribute to the spring fracture at the hook end of the spring due to heat and vibration.

Both the NRG, not the Mosquito, and the Booster use a welded wire loop tosecure the exhaust springs to.

exhaust springs breaking. The solution to the problem is to put a bead of silicone along the length of the spring . This stops the spring from resonation which is the primary cause of them snapping. I know this may sound like an odd solution but since doing this a few years I have never lost a spring .

Structural

I have just replaced my bearings on my old mosquito and you have to drill out the rivets and then use a little force to push them out with another tube inside but all the rivets have to be gone. And when you fix it, later, add some Locktite around the bearing and don't forget to heat it when you need to replace it next time.

Carb bolts issue:
i) We felt it most likely due to over-tightening BUT it had been OK for 14 months without any interference.
ii) There are no torque settings, but it could easily be worked out for that type and size of bolt. Feel is maybe OK if you do it all the time .... but torqueing would be a lot better.

iii) HT bolts are just that and actually quite fragile in shear. Tightening produces a considerable shear force and this on a bolt of only 4.2mm root diameter means a lot of care is required.
iv) If the carb is removed then new bolts should be fitted to avoid a secondary shear action due to slackening and then re-tightening.
v) As Riann said ealier, the Wasp now uses SS bolts and also thread loc.
vi) hanging more stuff on the carb such as airboxes, filters, brackets plus such things as cable action forces then combining this with the amplified vibration of a jerky old two stroke doesn't help for a long bolt life.

Normally you'd know when it broke as you would loose drive to the propellor! This time I didn't know about it until I checked the bolt after the flight. That was because Mike Broadbent, who replaced the bolt last time it broke, had the forethought to have the bolt drilled through the head and through the exposed threaded end and had passed locking wire around the pulley hub and through the hole at each end of the bolt. So that when it broke, it didn't fall out and the propshaft was still driven by the good part of the bolt. Incedentally this bolt was a 12.9 grade (which has a higher tensile strength than 10.9), although it was (as far as I can remember) supplied by the Mosquito importer at the time, who says the correct grade is 10.9

17mm or larger internal bore plastic tube (the sort off stuff that is used for water pipes) over the rear rigging wires. The length needs to be at least a meter long and the lower end of the tube needs to be secured to the corner of the control frame by thin cord or elastic to stop it sliding up the wire.

This then stops any chance of snagging the rear wires as the plastic tube will not bend to a tight enough radius to snag on a small protrusion and will allow landing legs, side tubes, wheel guards to roll off smoothly.

I have never flown with the 'R' clip. I took one look at that thing when I first got my unit and immediately threw it away. I replaced it with one of those rings that are often used to secure wing-nuts.

've had the bolt that goes through the big pulley & propshaft break twice. The second one only lasted about 10 hours but it was a bolt I'd found in a farmer's workshop that was the right size but probably not the right grade. (It was lost when it broke so I can't check the grade). The correct grade is something like 8.12 high tensile. (Please confirm or correct if anyone knows). It is very hard to drill. I know as we had a hole drilled through the bolt head and through the exposed thread (beyond the nut). We then passed locking wire through both ends of the bolt and around the pulley hub. This is in the hope that if it breaks again then the broken bolt will remain in place and drive the propshaft. It needs to be checked before flight to see if it is broken and just held in place by the locking wire!

The locking wire also gave me the opportunity to see a broken bolt. (Normally it is lost in flight). This showed that it had broken at the start of the threaded area. I've replaced it with a longer bolt, so there is no

thread (only plain shank) in the hub. From memory, I think a bolt with 50mm of plain shank is needed. I think that makes it a 65mm (or was it 70mm?), 12.9 Grade, cap head. I cut deep slots for the locking wire with a thin cutting disc in a dremel, as it's almost impossible to drill a hole in 12.9 grade steel.

I'm still using the original plastic pulley hub. I've not re-drilled the bolt hole through the hub and I'm using the original 6mm diameter bolt. (Not 1/4 inch).

The hang point to keel cut off distance is 1200mm or 48 inches for the Mosquito

The fabric straps typically just go around the down tubes and back to the clips. There is a cord with clip that goes around the keel and clips to itself to keep the tank from slipping down the tubes in a high "G" situation or if the straps get loose. I Your tank should have a rubber foam piece on one side that goes against the down tube and provides adequate friction to keep it from slipping

I was also told by Gus (thanks again) that using wire ties for the fuel line is not a good idea and can leak air because they don't clamp down in the hose uniformly. I've been searching for clamps small enough but haven't found any yet so I put the fuel line back on with two opposing wire ties until I find some. I don't have any air in the line anymore (at least for the time being).

Use the pink loctite for bolts that have to be removed regularly, use blue loctite for bolts that have to be in securely and are subjected to large amounts of vibration. Most of the bolts on the bug now use spring washers to retain them as it is a lot easier to undo the bolt with less chance of shearing them. Do not use loctite with nyloc nuts, replace nyloc nuts if you have undone them more than 2-3 times, ideally should be every time you undo them. Never use loctite retainer on bolts, this is for bearings and devices that are meant to stay put for ever. Missed the term 'threadlock'. The easiest to get is Blue loctite 'threadlock' 243.

Bent cable outer can cause a sticky throttle.

Ideas

I realise that there is never a totally foolproof system but I was very impressed with SA's thinking on the E start switch for the NRG. They have a rubber tube exiting near the pilot's shoulder and to start the engine you just blow down it, making the contacts on a pressure switch. The designer (Johan?) told me he once had a paramotor electric start switch itself on while the unit was in the back of his estate car and this led him to devise a better method.

I do use a nose anchor with a quick release system. A simple chord releases the catch. Just make sure the chord is long enough to grab once the DB is connected to your good-self.(This way you don't need to go forward through the 'A' Frame). I also use a second connector to nose of the glider (which is the back-up should the main release be pulled by mistake). This is secured

during rigging, preflight or stand-by. Release the standby, get in the bug, pull the chord, etc .....

A simple and easy way of tying down your glider after landing out is to carry a wire skewer with a length of strong cord fastened to it. This can be wrapped up and carried in the harness pocket. After landing the skewer is inserted in the ground at an acute angle pointing forward and the cord is fastened to the nose of the glider so holding it on the a frame level. After getting back into the harness etc the pilot walks forward, because the skewer is angled this action pulls the skewer out of the ground. The pilot then grasps the cord and places the skewer in a length of tube taped to the upright for stowage during flight. It's up to you to choose skewer length, cord length etc
a kill button on the upright for late engine stops when landing a must for tight landing fields.

Assuming that you take the prop off when transporting your FLPA, it is well worth making a rigid container for it. I have a plywood one, lined with thin carpet. It is dead easy to chip or dent unprotected props during carriage. Try Valley Supply in Redmond for sewer pipe or pvc plastic pipe with end caps. 6 inch pipe should be about right.
It's also worth storing it horizontally, so that the moisture under thevarnisdh doesn't all end up in one blade. You'll see GA aircraft stored with their props horizontal for this reason. Allways put your prop in to the car last, let it sit on the top of the Bug or anything else in the car to avoid damage. After 2 - 5 hours of flying, re-torque the propeller bolts. No settings just nip them up and do not overtighten the bolts. Wood will shrink slightly with age as the moisture eveaporates out.

Yesterday was also the first time I flew with an additional muffler. Last fall I was spining 9300 to 9200 RPM consistantly. With the addition of a Kawasaki KDX200 muffler after the standard Radne pipe I spin 9100. It could be attibuted to the cold dense air rathre than back pressure and I do not feel like taking the new off to compare. Remember this muffler is designed for a 200 to 220cc 2 stroke so I believe there is plenty of flow.

Back to noise reduction.
The muffler fits perfectly with an additional 2 copper elbows and 2 brackets.I also packed a thin piece of glass gasketing material (wood or coal stove door rope) in the tulip of the Radne pipe along with 3 more very strong muffler spring to hold it very tight. There is no exhaust or noise leaking from there at all.I got the muffler on Ebay for $5.00 plus $8.00 shippping.

Sounds like you degraded the muffler tuning. Bigger is not necessarily better. The higher revs of the Radne engine require a shorter expansion chamber to allow the sound waves to return at the appropriate time. 22-24 inches from the exhaust port.

For my NRG the diameter of the prop is 52.25 inches and the gear ratio is 3.54:1 (which, as I understand it, is also the same for the Explorer, Raven and Bug). My prop is a wooden one made by Tennessee Prop which is pretty similar in shape/size to the original; the specs I've seen on the NRG prop (some time ago - not sure it is their latest design) list it as 1350 mm (53.1 ") with a pitch of 535 mm. Somewhere I saw a spec on a WASP prop as 535 mm pitch on the same 1350 mm diameter (once again, that was some time ago, not sure if that still applies on their new design). By my calculations that puts the tip of the prop at about a 7.2 degree angle. At 900 engine RPM I calculated a tip velocity of around 585 ft/sec. For comparison, that is about the muzzle velocity of a high-powered pump-up air pellet rifle. It is also slightly over half the speed of sound, which is somewhere around 1080 ft/sec.

I did an approximate 'integration' of the prop area and came up with a projected cross -section area of around 137 in^2.

A belt should only deflect 1/2 inch with firm pressure with your hand/fingers. Shim as necessary to prevent slippage and excessive wear.

3/16 ID translucent line, rated for fuel. my "clear fuel line" It is marked 1/4" O.D. NYLON 12

driveshaft bolt broke again (should be 1/4", not 6mm).

For some time our group here in the UK have suffered from debris passing our in line filter and clogging the small filter within the Walbro carburettor. Several pilots have had their engines fail due to this problem and they have to dismantle the carburettor in order to clean out the debris.

First thing I did to tackle this problem was to replace the in line filter with a sintered bronze filter from K&N filters an American company I believe.

The second thing I did was to make a refuelling unit. This unit comprises a container, at least five-litre capacity with a transfer pipe with a large filter fitted.

The unit is self-supporting and fuel is easily transferred from the Jerry can into the refuelling unit. Because of the filter it takes several minutes for the fuel to transfer to the fuel tank but because the unit is free standing the pilot can get on with other things while this is going on. Fuel is taken from above the bottom of the refuelling unit and so water if it exists is removed from the fuel. This arrangement and replacement filter is new and time will tell whether or not it is succesful.
In the bottom of the carb there is a hole with small spring valve

inside. Push it with your finger while squeezing the bulb until the fuel will start to bleed from the air filter on your hand. Stick your finger tip in that hole and press while squeezing the inline fuel bulb. Release the diaphragm first, bulb second. Some coordination required. Take cover off and make hole bigger so you can get your finger tip in it.

be sure the starter gear mechanism was very well greased, so that sounds like it should be a regular maintenance item.

There are only 2 screws holding the starter on, so it is simple to take off. I just took a look at my spare (I immediately bought a spare - in addition to the warranty replacement - when my last one blew up). The gear inside turns on the shaft, with some friction, in one direction. When you turn it in the other direction, it spirals out to the end of the shaft (the engaged position) against a spring. The gear relies on inertia to get itself out to the engaged position. When you turn the starter on the shaft starts spinning very quickly, and the gear cannot accelerate that fast, so it spirals out against the spring. I suspect a lack of lubrication, so that the gear actually accelerates with the shaft instead of spiraling out.

i have been using fishing wire trace and the crimp things than come with it, 100lb wire crimps work best. go to any good fishing store they should have it. unless you live in England (i dont think they have big fish). use electricians pliers with the crimp tool to squash. I have also replaced some reflex lines with this stuff its good. All my bolts / nuts are loktited everybody uses it

Radio

Air band reception is a source of never-ending problems for many folks with an engine. As it is simple AM, it simply doesn't have the same immunity to interference that FM transmission does. And we're stuck with it for at least your and my lifetimes, since it is a "standard" that millions of aircraft are set up for.

That's no help, is it?! OK, there are only a few basic strategies.

1) EMF shield the radio. This requires that you put in a Resistor spark plug (not even sure if there's an R version for this application), metal can plug caps (not just foil!), shielded spark plug leads (using woven metal braid) and a shielding enclosure for the complete ignition area (the best ones are made out of a lead impregnated metal composite plate) as well as paying strict attention to earthing.

2) Shield and earth the ignition kill switch lead (if you have one) and keep it as far from the radio and antenna as possible. The kill lead makes a great antenna for the engine to transmit interference.

3) Get the radio antenna as far away from the engine as possible and make sure the maximum reception plane of the antenna is pointing away from the engine. On microlights, the antenna is often sited at the top of the kingpost for just this reason. You could do this too.

That's about all that's possible.

For some basic info on the whole deal, see my web page:

www.aerialpursuits.com/comms/menu.htm

Airband mics -The reason for the problem is that way back, 60 or so years ago, when radios first started being used in aircraft, carbon microphones were standard. That fixed the standard, which has not changed since, even though carbon mics are seldom used anymore. But even the new airband electret mics all have a special circuit built in to allow them to work with the old radio standard. Here is a link to a full description of the problem: http://members.ozemail.com.au/~aerial/comms/mikes.htm And here they show the wiring diagrams for a number of different radios, including the airband models. Note that all the airband radios require the pre-amplifier, which they sell. http://members.ozemail.com.au/~aerial/comms/pttccts.htm Save these links, you may wish you had them someday. If they don't work, try http://www.aerialpursuits.com and follow the link to "communications" and "air band radios". And thank you John Reynoldson for ending my months of frustration!

at "poweredparaglider.com". Look on the navigation bar on the left for "technical info", click on it and look for the "electronics/related" heading. Click on it and look for the article on "How to build a under helmet radio headset for under ten bucks". It works like a champ. BTW- This website has a ton of information with respect to 2 stroke engines, tuning, troubleshooting, props, theory, etc.

The older Mosquito manual stated to use 24:1 =4% , Now that has been updated , best to use fully synthetic 32:1 =3% 91 to 98 octane petrtol .

I have been mixing at 25 to 1. I know that there are some guys running 40 to 1 but I was afraid to go that high when breaking in a new engine.

Maintenance

You have to take the starter off (only 2 screws) Use only graphite powder around the sliding parts of the gear. Probably also not a bad
idea to order a spare direct from Radne (cheaper, but longer time to get it). That way, if it does fail (I've heard of this happening to several) you can at least still go flying that day!

I Have disassembled the starter and examined the
helix carefuly. There does seem to be very small sharp burs on
some of the splines just where they terminate on the shaft.
I have noticed also that when hand turning the cog, it does not like side pressure off-centre of the shaft. It occured to me that in normal opperation when the throw-out cog engages with the flex plate, there must be significant torque on the whole mechanism. Anyway, the internal and external helix do not slide smoothly and seem to jam. I will try washing with thinners and lubricate with graphite. That cir-clip on the shaft is a tough little mother to
get off!

First, Don't seize the engine up! It wasn't obvious it had happened. The unit just wouldn't tick over and we assumed it was due to the tick over jet being blocked. It was only when we took the engine apart we saw a big chunk out of the piston and chamber. This might have been due to 2 things: 1) The engine had spent periods of time lying without use. I wonder if the fuel had evaporated leaving a thicker residue stopping the piston ring performing at the instant it was started up after its lay off. If you're going to leave your engine in storage then fill the chamber with oil poured through the spark plug hole. And here's the important bit. Before you start it up after a lay off, turn the engine over slowly with the ignition OFF to help dissolve any solids and free any stuck bits. Then start it up. 2) I also wonder if it seized because I ran it up too much before take off. Perhaps the engine got too hot. Now I start up and just give it a few blips with the throttle over the course of 30 secs or so before taking it up to full revs. Then as soon as poss I take off. That's the boring bit over.

Clean your air filter, replace spar plug and fuel filter. You can wait with it but it cost nothing and worth. From my experience check the bolts and nuts of the exhaust connection and the bolt/axis of the prop brake.

> Standard decokes revealed substantial carbon build up; some engines with 60 hrs had more than others with twice the hours . The carbon in most cases had migrated and built up around and worse, inside the top (only - not counting scraper) ring. Effectively the ring was seized in position within the piston. De-compressor valves were also effected to some degree and at worst this was causing leakage and damage to the seat. Result was measured lowering of performance ... quite a lot in some cases although pilots had not noticed anything. The mixture has some bearing on carbon build up and after the first 50 hrs a de-coke may be wise. Plugs need to be checked and cleaned regularly ..... Watch you don't strip the thread in the head or your into helicoil territory .....or worse! > > Control cables had moved from optimum adjustment resulting in throttles that were not fully open or chokes that were not fully open or closed ... a slighty closed choke will effect running. Diaghrams in the carb, even though they looked OK were becoming porous ..... this results in an inability to tick over properly if at all. Damaged diaghrams have even been found on new engines! > > Also loose clutch dog screws; broken exhaust systems, damaged cables.. > > > Basically if you just run your machine with only the basic maintenance you could end up with an expensive bill. If the cylinder block is scored by a stuck ring it not cheap.... a new engine is almost better. It would be useful to check the engine performance if you are able, as you can be 10% down and because it was gradual it could have gone un-noticed.

Early on I realized that my throttle cable had slipped and caused me a loss of power. As a result I added a preflight check to make sure that, at least the mouth throttle, would cause the throttle lever on the carb to go all the way against the stop. More recently I found, through a rather unfortunate incident, that it is even more important to make sure that the throttle shuts all the way off. As a result I know make sure that the mouth throttle gives me the full range. Also, because of all the power issues I have a Tiny Tac permanently wired and routed on the harness and as part of a preflight I run it up to see where I am.

My suggestion (from the fly-ul group) for decarb of the engine. Use SeaFoam: a little liquid SeaFoam in the sparkplug hole, replace the plug, hand prop a turn or two, let set overnight, fire it up and spray SeaFoam in the carb intake. Caution, not too much liquid SeaFoam in the sparkplug hold, and when starting, it will blast a LOT of carbon loaded gunk out the exhaust (and onto your prop.) The Sea Foam is stocked by most Boating Related Stores.. I suggest you order the Radne Repair Manual. Radne is rather quick to respond to emails sent them. That is how I found they do have the Repair Manuals.

he said it seemed like it was starving for fuel and that it was not a carbon buildup problem so I proceeded to take apart the carb and following Randy Haney and john@cloudbase57's advice I checked the internal fuel filter (the little screen under the upper cover and gasket) and found a significant amount of debris on the screen.

In spite of filtering fuel in to the fuel tank and also filtering left over fuel back into the petrol container five pilots in our group, all using different fuel containers have had engine failures. An investigation proved that the problem was a blocked filter. The fuel systems are on the Bug and the Wasp and are fitted with additional in line filters however, the small filter inside the carb below the carb cover opposite to the tickler button is the one that gets blocked. I recommend that pilots regularly check this filter for trapped fluff as a precaution

Recent problem found is the collection of small hair like debris on the filter within the Radne carb. This debris if not checked causes unexpected engine failure, usually while in flight.It has been suggested that the hair like debris come from degradation of the fuel tank, however we are fitting a sintered bronze in line filter in place of the fine nylon mesh type filter usualy fitted as here again it is suggested that the mesh filter although fine enough to stop the hairs when they meet the filter side on some of the hair eventualy passes end on through the mesh, Of course when the unit is packed away the collected hair can move away from the filter where it again meets the filter when the unit is assembled again. This problem has been encountered by several pilots around the country and experience has shown that a check of the carb filter every 20 hours use maximum should eliminate this problem.

Here is my suggestion about the power loss, if you take off the carbs pump cover,inside there is a small gorse filter which after atime clogs up with fibres

from the fuel tank.It's amazing i know,but the fibres are like thin hairs which pass through the inline filter and form a cotton wool like substance in side the carbs filter which is only 6mm in diameter.This has happened to me and five others who fly power units after only a few hours. I have now removed this internal filter and rely on a good inline filter which has a large surface area of filtration. This is good to know, but an obstruction like this should cause a persistent loss of high end RPMs rather than an intermittent drastic drop in RPM's.

After regular warm up that includes 30 sec of full power, just before I stared to run, I gave another full rev and I lost the power for 3-4 seconds again and the engine even almost stoped once. I released the throttle, then full again for another 30 sec, It was OK and I took off. My conclusion is the same as R. Cobb. Air bubble remains in the fuel line even the engine warmed up well. It is better to run it more than once with full power before the take off until no signal of power loss at least two or three times.

I further suggest that you acquire a Mr. Funnels Model FBC, 5.0 gpm filter/funnel that provides 5 micron filtration and water removal, while dissipating static electricity as it is made of an electrical conducting plastic. I would run my fuel through this filter every time I transferred fuel

The Radne Racket 120 which is typical for the FLPHG systems in my opinion is very low maintanance and easy. Obviously if you break something it needs to be replaced but the standard maintanence is quite simple. The following hours are powered hours of course. 2 hours a week powered to keep me in the air for 4 hours a week every week is 100 hours powerd flight per year. Change spark plug every 200-300 hours depending on number of flooded starts. The plug is exposed and only requires a wrench to remove and replace. Change piston rings ever 200 hours. 4 bolts removes the cylinder and they are easily accessible. A long allen wrench is required. Slide off cylinder, stretch rings out of piston groove, slide new ones on. Clean up sealing surfaces of cylinder and crankcase. Replace cylinder gasket, squeeze rings tight and slide cylinder over rings. I just changed the cylinder not because of wear but because the cooling fins were cracked off. It was a piece of cake. The clutch drum shold be inspected for wear at 300 hours. No need to replace if it is not gouged. Change piston every 500 hours. Same as the rings but need to press out the piston pin. I have not done this but it too looks easy. The gasket set and or diaphrams on the carbs is just a matter of remove and replace once a year.

A couple of times, once on hitting a big thermal and once coming in to land, I've found one of the arms of my Bug ending up the wrong side of the lower rear rigging, putting me into a fairly severe turn. Both times I managed to get out of it without any further problems but 'getting out of it' involves a kind of rotating movement into the turn then a push out before pulling in and levelling out. This seems only to be a problem on some gliders, depends on a frame and side wire geometry. On fix is to slide some 3/4" plastic pipe (available from any DIY store) over the rear rigging wires. just a few inches will do -

check this on your glider. This acts like a roller and resists hooking in the first place, and allows easy un hooking without a fiddle if it does happen.

have heard many stories of exhaust springs that has broket and desrtoyed propellors, wings and many more. Many manufacturers use springs that has not been designed for for this application. I have just posted a picture on the photos section of some springs that is originally made for motorcross application. They have a tapered end construction with the hooks seperate from the spring which allows for movement with no stresspoints that can break.

Cheek the carb is secure and that the carb bolts are tight, any air leak here will cause the engine to run lean. Fuel starvation will also do this but generally you will know about it well before a piston melt down

Q: My Radne engine has close to 200 hours.In the Radne manueal they suggests to replacethe piston rings and some parts of the carb.
I wonder if I have to do so even all works fine (so far..)or to wait until the engine will start to make troubles.
A: Inspect your engine regularly, before and after flight. Watch you "Tiny Tach" for loss of RPM, over time. My motor has less hours than yours and anything that isn't fastened down, tends to rattle off!

Tacs

I have a screened cable running down my upright with an audio plug on oneend and a socket on the other. My tini tack sensor lead stops near the crabwith plug to fit upright lead. The tini tack has a socket to fit to theother end. Result is tini tack on control frame. Any problems the plugswill pull apart.

There is information there on reseting and modifying these units. http://www.tinytach.com/the Raket needs the 2c model. It has one spark per revolution of the crank. Pretty standard ignition setup.

When you are thinking off adding tachometers, it is better to look at getting something that will also have a temperature guage. There are two main types that are most commonly found, one the OPPAMA type PET range and the other the RPT SYSTEMS. If you are not flying compititions and/or changing the fuel mixture in flight there is no need for using a EGT system and would find CHT system to be just as efficient. The RPT SYSTEM is the cheaper of the two and has a larger display indicating all the information at the same time. Price is normally around GBP60 for the instrument and between GBP30 and GBP50 for the under sparkplug type temperature sensor depending on type and manufacturer.

1) MyChronLight: (MRT) Tach & Temp ($199) http://www.mojosgear.com/html/cpacc98.htm
[Needs the temperature sensor ($35]

Fuel & fuel lines

"Free Flo Vent Tube"

http://www.accelerationkarting.com/fuel.html

Well, there are quick disconnect fittings that shut off the line on BOTH sides of it. I found one for clean-room applications that allowed less than .1 cc of air into the line while reconnecting. It costed some $250! One that I did purchase allowed .3 cc of air while reconnecting for $50 PS&H.

By installing the fitting UP-Stream of the squeeze bulb, the .3cc air bubble flows down to the bulb and stays there.

I am sure there are plenty of manufacturers that make such fittings. The one I used was by Swagelock, SS-QC4-B-400 and SS-QC4-D-400. See www.swagelock.com. The key is that BOTH sides of the fitting lock off the fuel from flowing out or backing up.

there's nothing that gets degraded if the petroil mix stands still in a proper container. The only thing that happens is that oil separates from petrol and sinks to the bottom (or floats to the top; I don't remember anymore). The two mix easily, however, and a vigorous shake will remix them quite effectively.

Fuel line consider http://www.mcmaster.com/ part# 5108k45
at $0.32 per foot.

When you land immediately after one of those faltering runs, is there any sign of air in the line then? How about the dangler inside the fuel tank? The tank will probably be at a different angle when flying than during ground runups - is there anyway it could be suctioning itself to the bottom/side of the tank when it is tilted? Also check the routing of your fuel line - is there anything that could be pinching it in flight that does not pinch it on the ground? It may not need to be pinching it - if it gets pulled tight just as it is making a bend around, say, a frame tube, that could flatten the tube and restrict the flow.

If you can't find anything, maybe try rerouting the fuel line anyway - perhaps completely outside of the harness just to try it - and replace the fuel filter while you're at it.

1. It must be fuel problem.

2. Because the engine is doing well for the 5 minutes on the ground
   you must check the fuel tank breather, its take few minutes to
   feel fuel starvation if there is not enough air into the tank.

3. Check the carb diafragma if installed properly.

4. Check-clean the air filter and the fuel filter.

5. See if the chock open completely.

6. His last word - this engine born to work 500 hours if you do not

try to change it/inprove it. I agree.

it would be worth progressively knocking the throttle back bit by bit when the engine starts to falter. If it doesn't make any difference then at least you can probably rule out starvation and resonance problems. A couple of times I've had this sort of thing on my Mossie throttling back seemed to get the motor 'over the hump' and I was away. Also, does your tank have a good clear vent?

Second of all, I really recommend staying away from inline filters. In my experience, no matter how good they are; they sooner or later provide an opportunity for a fuel/air leak. Get a good "clunk style" filter! The kind that attach to the end of your fuel line and act as the weight and the filter while submerged at the bottom of your tank. Clunk style filters can be found at lawnmower shops, motorcycle shops, and some hobbie shops. You can also make one simply by taking your inline filter and using it at the end of the pickup hose. You weigh it down by putting a big nut on the end of the line before the filter. Yes, the inline filter/heavy nut combo is quick and easy and just as effective as an actual clunk filter.

THe Racket 120 is designed to run on a mixture of 4%synthetic oil in lead free gasoline, 95 or 98 octane.
My Wasp manual informs me to use this ratio for the first twenty hours and then it can be reduced to 3% to reduce plug oiling
DO NOT USE A SYNTHETIC FROM THE START - use a cheaper semi-synthetic for about 10hrs to let the engine 'wear in' then change to synthetic. A synthetic oil is very slippery and can allow bearings to skid rather than rotate - hence the semi-synthetic first.

It also seems that some US gasolines contain a significant amount of water from the bottom of the gasoline retailer's tanks. The water is often in solution with the alcohols in the fuel sample, and invisible when you look ata specimen. However, when oil is mixed and the solution is agitated, a water-rich phase can separate out and settle to the bottom. The fuel line then sucks a sample of this very poor quality fuel, and it manages to burn at all, may blow itself up. Most often, it causes the engine to gag, sputter and then quit.

This engine really sucks (literally) I had forgotten to remove the breather tube plug. Lucky I didn't start with a full tank. I now have a warning written in red on the tank, and will add `unplug breather' to my check list.

I wrote this email to Radne: "Please also tell me what oil mixture rate I should use. Some people told me 24:1 and others have told me 50:1. I'm not sure who is correct." ********** This is their reply: "We recomend 5% mix." Best regards, Marie Radne ********** That comes out to 6.6 oz per gallon. Or for a 1.2 gal. (Mosquito) tank: 7.9 oz. Radne lists Castrol TTS and Shell Advanced Racing M oil on their website. I called all over, but was not able to get the Shell VSX2 in the USA. It's only available overseas. I've heard that

some pilots start out with a 24:1 mix, then after 10 hours go to a 50:1 mix. Is this okay for the engine? So, what is the final answer here! What should I do?

Ignition

When I received my first harness it started great, then when warm it would die and not restart until cold. The resolve was correct spark coil clearance

The original cells from Sw. AeroSport is Sanyo 2400 mAh high capacity sub c-cells. Designed to leave high current. The reason for NiCd is that they still leave the highest current. You can find NiMh cells for RC car racing that are able to leave enough current but they will hardly be chaper. We have tried 2200 mAh NiMh industry cells but they didn't do the job. Another reason for the NiCd is that they stand the cold better than the Nimh.

Sure you can use a led battery for a lot less money. But consider double weight and less Voltage=less rpm on the starter engine. If it is really cold you will get problem, we have tried in -20 degrees.

The fuse is a must. The original one is on 40 Amps, we blowe'd 30 Amps with wet engine in cold weather. When the starter finally rev. full the current is much lower.

The battery pack that came with my NRG is listed as 14.4 Volts, and perhaps 1800 mAh (NiCd). You can easily make one of those up out of NiMh batteries, which have more capacity and fewer problems than the NiCds. You can now get AA NiMh batteries that are 2100 mAh, and I imagine a slightly larger battery, like maybe a 'C' should have a lot more capacity than that. That's 12, 1.2V battery cells to make up the 14.4 V pack.

I'm sure we agree. But It would be nice if there were one more cell in the pack, pushing the fully charged voltage to 15.4. Starting the engine should involve a quick pulse of the starter, similar to the action of pulling a start rope. Running the starter for extended periods is counterproductive in all cases.

Lead acid gel cells are preferred. Might consider a slightly higher voltage if available. Lead acid batteries do not have "memory". They are best cared for with a "floating" or "adaptive" charger --- NOT a "trickle charger". They love to sit on the charger and become quite offended if allowed to discharge below 12 volts. Such repeated action may result in their demise.

If you take the starter motor off and work the starter gear back and forth along the shaft with a good amount of grease until it becomes free and smooth, this will free it up and allow it to work, we have had a couple of starters that have had sticky gears and this method seems to cure the problem.

Power loss suggestions: Have you checked the ignition circuit? Make sure the magneto coil is tight, the plug wire well attached and the spark plug in good condition. If an ignition system is marginal, it will be more likely to miss under high loads. Probably not your problem, but one you need to check and rule out before spending any more time focused on the fuel system.

I just went to my unit and pulled the plug wire off the spark plug to try to measure the resistance in the wire, but there does not appear to be any

continuity to ground or any of the terminals I could get to, so I'm not sure how you could check the wire directly. Do you have a Tiny Tach? They work by picking up the inductive pulse from the plug wire - if it is misfiring the tach should start giving much lower/erratic readings (assuming you can find time to look at it while ground skimming...)

The ignition unit should have 14 thou between its yoke and the flywheel magnets, plugs should have the correct gap of 20 to 25 thou between the electrode and the side of the plug.
Plugs should be Nippon Denso and the correct spec other equivalents will do but there is a difference in the construction of the Nippon.
Check the de – compressor valve, many leak, oil in the cylinder head fins is a tell tale. This fault causes a loss of power rather than poor starting

The CDI on the Radne needs a certain rpm to get it firing, if the engine is out of tune which often means that the plug gap is too great or the gaps on the CDI's pick ups (terminals) to the flywheel magnets are too great (more than 400 microns), then the engine will be poor to start, the faster it can turn over the more chance it will have to fire.

The electric start turns the engine over far faster than the kick / pullstart and will start an out of tune engine more easily than the kick / pull start.

you can get an easy 100 starts from the 7 amp battery - however we use a 4 amp which weighs ca. 1 .2 kg less. and still get a sufficient 50. We actually reccomend having two of the smaller batteries, which you can rotate and this way you always have a safety. To be specific when I say 50 starts with the 4 amp I actually mean 100 start cycles. Once is with choke until engine fires, second one is actual start. Electric start is a great invention, thank God for ES.

Correction,

For slow speed screw read Low speed valve.

John.

>>Communication over 2m radios was impossible at full throttle; it was very doable at idle, ideal with engines off. -Any tips on that one from the peanut gallery?? Please :-).<<<

Hello Tom,
Good flyiing. I have read in the German chatbox for FLPHG that the solution is to wrap the cpl. ignition high tension cable incl. plug cover with alu-paper or alu tape (don't know the english word). I

have not tried this myself yet though. This seems a simple but very practical solution. I gues it looks better if you wrap isolation (plastic) tape over the alu-foil wrapping, to keep it together

Prop Repair

Date: Wed, 25 May 2005 10:25:34 -0700
From: "Dave Little" <twoeak@comcast.net>
Subject: Re: Explorer Prop

I have had reasonable success at repairing the carbon props. I have some that have quite a history. One sucked a wash bucket into itself and sent pieces through the two walls and the garage door.
Each blade repair $25 -$50, depending on how much need be restored.
Blades will be tested and balanced.
We also have new Explorer blades at Hidden Mountain Flight.

Dave Little
360-455-4741