



Neighbor Appreciation Day

October 15th, 2011

The annual Octoberfest and Neighbor Appreciation Day will be held concurrently on Saturday October 15. Last month, the Board asked members to donate toward the costs of both events. For the guest rides for neighbors, donations can take the form of assuming flight charges (on Flight Cards) or the payment of cash donations along with monthly billed charges. Any cash donations should be identified as such. Come on out on October 15 to enjoy the Fest and see the smiles on the faces of our neighbors.

CCSC Board of Trustees Election

for 2011

As specified in the By-Laws, an annual election will be conducted in November for four (4) CCSC Board positions, for terms ending in November 2013. Service on the Board takes some time and effort and often does not provide instantaneous gratification, but it is important, in fact essential, for the perpetuation of the Club and everything you get out of your membership. It is also an excellent way to learn about the Club's operation. We literally cannot continue to operate without the stewardship provided by Members who are willing to serve on the Board. Please consider serving for a two-year term. Any member who is interested in serving on the Board and/or nominating another member is requested to notify Michael Hayden, CCSC Secretary, by October 21, 2011. Please use the following e-address: ccsc.secretary@soarccsc.com

Along for the Ride: A Review

by Steven Statkus (Safety Committee)

The recently minted private pilot – glider, had just come out of winter's hibernation and hadn't flown since last fall. He needed three flights to become current and chose to do so in the K21. His eighth K21 flight was under instruction and his performance was acceptable. The next day flight nine was a K21 rear seat checkout, which also went without any problems. Flight number ten, solo apparently went fine until touchdown and here the details get somewhat vague. The touchdown was followed by multiple nose to tail strikes followed by the glider hitting a bump on the runway and launching itself and the pilot for another attempt at landing. Witnesses differ on the approach speed, rate of descent, position of spoilers and touchdown point. The common comment from the observers was that prior to a wheel, (nose, main or tail we don't know) contacting the runway the pilot stowed the spoilers. This observation was supported by the pilot as he felt his sink rate was too high and by closing he spoilers he would ...continued on page 2

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In Brief

- The Oktoberfest is happening this weekend and the temperature looks great. Come out and help our neighbors enjoy our little slice of flying fun.
- The Grob 103 is back at the glider port after some repairs.
- The Grob 102 is being trailered to PA for AD repairs.
- The fuel charge will remain the same for this month at 36¢/100 ft.
- The CCSC Board is accepting nominations for the November elections from those Members that wish to help with the running of operations. Five positions are up for election.
- The Annual Meeting of the CCSC will take place on November 8th, 6:30pm at the club house.
- There was no quorum of the SSD in September. As such there are no minutes.
- The tenant status will be a topic of discussion at the SSD board meeting this Saturday as candidates are reviewed for consideration.

Frequent Flyer Notes

- Submissions for the Frequent Flyer may be emailed frequent.flyer@soarccsc.com. They are due the Wednesday after the CCSC Board meetings. Articles submitted may be edited or reformatted for space and spelling.

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arrest the sink rate which may have happened but the glider contacted the runway with excessive energy and most probably contacted either the nose or tail wheel initiating the oscillations at which point the pilot was along for the ride. He was fortunate to hit the bump and relaunch for another try. but was rewarded with more oscillations, suggesting another nose or tail wheel landing with excessive energy.

So, what are the lessons learned?

1. It probably takes more than three flights to regain your keen flying skills after a winter of no flying. If you're going to fly the glass ships take a few flights with some of the instructors who fly them regularly.
2. Good landings begin with a precise downwind leg (Gabe 92) controlling airspeed, altitude and touchdown point. Several instructors suggest once the spoilers are deployed they are not stowed until rollout.
3. The goal for landing the glass ships should be to land on the main wheel with minimum energy, not making large corrections to pitch attitude near the runway. If high or hot, land long, we have extra runway at CCSC.
4. The CFI will be providing a standard for landing glass ships that represents the best practices from the instructor corps. When it appears in this newsletter please take the time to read and think about the process.
5. Prior to taking a glass ship aloft sit for a while and become aware of the horizon on the left and right. This is the attitude you need to achieve to arrive safely at minimum energy.
6. The nose wheel/tail wheel strikes on the runway can result in costly repairs to the nose wheel structure. As a minimum it costs a tail wheel replacement. Such an event must be reported and the glider red tagged for structural inspection before the next flight, no exceptions.

Pop Quiz

by Tom McDonald (Chief Instructor)

This month's Pop Quiz deals with the numbers involved in flying gliders. I used Schweizer 2-33 data. If you fly something else, apply the numbers for your aircraft. Fill in everything you can without looking at the answer key. You should quickly see how the information is organized, and be able to use this structure to help remember the information. Every number you need to stay legal at CCSC and pass the FAA knowledge test is included.

- ___ FAR part: definitions
- ___ mile vis and clear of clouds req'd in Class G airspace
- ___ years between flight reviews (biennial)
- ___ degrees C, standard temperature lapse rate per 1000'
- ___ landings in last 90 days in category and class to carry passengers
- ___ miles visibility required for flight in controlled airspace
- ___ spacing between cloud streets is typically ___ times the height of the clouds
- ___ degrees F, standard temperature lapse rate per 1000'
- ___ $(\text{temp} - \text{dewpoint}) / \text{_____}) \times 1000 = \text{approx height of cloud bases}$
- ___ Gs, 2-33 limit load factor
- ___ \$, rental fee of 2-33
- ___ recommended max number of tows before refueling a Pawnee
- ___ \$, youth member dues
- ___ months between annual inspections
- ___ minimum age to solo in a glider
- ___ psi, 2-33 tire pressure
- ___ degrees C, standard temperature at sea level
- ___ minimum age for a private license in a glider
- ___ minimum age for commercial license in a glider
- ___ \$, member dues
- ___ pounds, weight of 2-33 removable ballast
- ___ :1, 2-33 best L/D
- ___ months between flight reviews
- ___ months between transponder inspections
- ___ standard altimeter setting in inches of mercury
- ___ days to report change of address to FAA
- ___ 2-33 stall speed, solo
- ___ 2-33 stall speed, dual
- ___ cents per 100 feet tow charge
- ___ 2-33 min sink speed, solo
- ___ 2-33 min sink speed, dual
- ___ FAR Part: covers aircraft maintenance
- ___ 2-33 best glide speed, solo
- ___ 2-33 best glide speed, dual
- ___ feet, 2-33 wingspan
- ___ degrees F, standard temperature at sea level
- ___ days to report DUI to FAA
- ___ FAR Part: certification of pilots
- ___ 2-33 maneuvering speed, max gross wt

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...Pop Quiz continued from page 2

- _____ 2-33 max speed for winch tow
- _____ FAR Part: designates types of airspace and reporting points
- _____ 2-33 CG forward limit
- _____ min % of rope strength to glider GW
- _____ \$, intro flight fee
- _____ 2-33 CG aft limit
- _____ days for landing currency
- _____ series advisory circulars cover ATC
- _____ FAR Part: aircraft operation rules
- _____ 2-33 max speed
- _____ 2-33 max aerotow speed
- _____ hours required in category, class and type (if required) to tow a glider
- _____ hours max between inspections of commercial-use aircraft
- _____ 2-33 min front seat weight, solo, with ballast
- _____ radio frequency at the gliderport
- _____ radio frequency at Red Stewart Field
- _____ 2-33 min pilot wt, solo, no ballast
- _____ max % of rope strength to glider GW

- _____ pounds, 2-33 useful load
- _____ feet clearance below clouds in controlled airspace
- _____ pounds, 2-33 empty weight
- _____ AGL base of class E airspace near most IFR-use airports
- _____ CCSC field elevation
- _____ feet clearance above clouds req'd in controlled airspace
- _____ foot ceiling req'd for basic VFR weather in controlled airspace
- _____ standard altimeter setting in millibars
- _____ pounds, 2-33 max weight
- _____ AGL base of class E airspace over the gliderport
- _____ feet cloud clearance req'd horizontally in controlled airspace below 10000 feet
- _____ feet, length of runway at CCSC
- _____ more than _____ pounds gross weight requires a type rating
- _____ flight level, start of class
A airspace

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CCSC October Board Minutes

by Michael Hayden

The CCSC Board of Trustees conducted a regular meeting in the clubhouse on October 1, 2011. The meeting was called to order at 9:48 a.m. by Paul McClaskey, President. Six Board members were present: Paul McClaskey, John Murray, Jim Lowe,

Mark Miller, Charlie Richardson, and Michael Hayden.

Charlie was welcomed back to the Board, having served previously and having been appointed in the September meeting to serve again.

Secretary's Report – By a
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Classifieds

Editor's note: Classifieds can be sent to frequent.flyer<at>soarccsc.com. Date of entry noted in (). Ads may time out in 3 months unless re-submitted.

For Sale (6/11): 32' Dutchman camper trailer for sale in club campground \$2500. Bedroom with queen bed, living room and eat in kitchen. Two other fold out twin beds. Sold fully stocked with household items. No road miles. For info contact Jenny Rytel 614-332-2004 or montjen<at>gmail.com.

Share For Sale (2/11): Join the Redwings! One share for sale, \$1000. A great group of guys and a great SGS 1- 26. A good way to build up flight hours and have fun. Contact Brad Lewandowski for details 513-265-8544 or blewando1<at>gmail.com.

For Sale (7/11): Two one-third shares in Standard Libelle201b N11RD (n11rdbird). Serial Number 74 with a

245 pound payload. Great flying and thermaling glider with a May annual. Includes an Eberle trailer and tow out gear. All ADs complied with; New Tost Hook; New Microair Radio. Includes Cambridge GPS and L Nav, parachute, and great partner (Richard Cedar). Call Rolf, (n11rdbird@att.net) at 937-271-5003.

For Sale (5/11): Price reduced! 30' Motorhome for rent or sale in campground. \$50/month or \$3500. For info contact Terry Buker. 786-512-3313 or email tbuk<at>juno.com

For Sale (7/11): 1991 Elite 29ft Travel Trailer in great shape. Large roomy interior. Interior is in great shape. Everything works and has a newer Refrigerator. We are the 2nd owners and purchased it in ~1992. Sitting on a nice site at the Gliderport. Asking \$3500. call Norb at (513) 243-6465 (d) or (513) 774-0380 (e).

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unanimous vote, the Minutes for the September 10, 2011 meeting were approved as presented previously by Michael.

Treasurer's Report – Jim reported that the bank account balances total approximately \$21,000 at present. As has been the trend, income has been significantly lower than budgeted. An increase in monthly dues and/or fees to members may be necessary in the near future. By a unanimous vote, the Treasurer's report was approved as presented. Jim advised the Board that he will not stand for re-election in November. On behalf of the entire Board, Paul thanked Jim for his 12 years of service on the Board.

Grob 103 Repair – John reported that the wing repair is proceeding, with the application of new outer skins to the damaged area being the next step. He estimates the date of completion as November 1.

Facilities Report – Marcos Aranha has not attended a Board meeting since he was appointed to the Board and to the position of Facilities Director on July 2. In his absence, Charlie volunteered to take on some projects, specifically repairs to the rain gutters on the red barn and maintenance of the mowers. Any member with expertise and/or interest in helping is asked to contact Charlie.

Towplane Maintenance Report – Paul reported that Pawnee 48L has been taken out of service for investigation of its recent low-power performance.

Social Activities Report – Mark Miller reported that the annual Oktoberfest and Neighbor Appreciation Day will be held concurrently on Saturday October 15. Last month, the Board asked members to donate toward the costs of both events. For the guest rides for neighbors, donations can take the form of assuming flight charges (on Flight Cards) or the payment of cash donations along with monthly billed charges. Any cash donations should be identified as such.

Vice-President's Report – John reported that the time lag between an applicant's acceptance into membership in CCSC and activation of his or her SSA membership is not considered by the insurance broker to be problematic.

Safety Investigations Report – In the absence of Steve Statkus, who chairs the Safety Review Committee, Paul led a review of the several recent investigations.

Low tow after late glider takeoff – By a unanimous vote last month, the follow-up for this investigation was accepted as being complete.

Failure to release on 2-33 – By a unanimous vote, the follow-up for this investigation was accepted as being complete and the Board agreed to follow up with the Chief Flight Instructor to ensure completion, implementation, and publication of a new soft release training standard.

Hard landing in ASK 21 – By a unanimous vote, the follow-up for this investigation was accepted as being complete, the Board agreed to consider revising the UOP requirements for flying the high value fiberglass aircraft, to follow up with the Chief Flight Instructor to ensure completion, implementation, and publication of a standard procedure for landing an ASK 21, and to follow up with the Director of Operations to ensure communication to the Crew Chiefs of their responsibilities when a hard landing occurs in the future.

Towplane low fuel occurrence – By a unanimous vote, the follow-up for this investigation was accepted as being complete and the Board agreed to follow up with the Chief Tow Pilot to ensure completion, implementation, and communication of a standard for the number of tows between refuelings, and to follow up to ensure that the fuel gage on Pawnee 33Z is confirmed to show empty when the fuel tank is drained.

Grob 103 collision during taxi – The investigation report was provided to the Board along with a recommendation to accept the investigation as closed. However, the Board deferred action until next month to allow Paul to obtain more information from Steve in the interim period.

Legal Review Report – Paul reported that the consultation with attorneys in Illinois are ongoing and that on their recommendation, an Ohio attorney will be consulted on issues specific to Ohio law.

Financial Audit Report – Paul reported that Marybeth McManus and Pat De Naples completed the audit of the books for 2010. Some issues were identified, but none of them are ongoing. Paul will distribute the Auditors' report to the Board.

Budget for 2012 – Paul asked Jim to generate a first draft budget for 2012 on the basis of averages over the past several years. The Board will then consider areas of the draft for further study.

CCSC Board Election 2011 – As specified in the By-Laws, an annual election will be conducted in November for four (4) CCSC Board positions, for terms ending in November 2013. Any member who is interested in serving on the Board and/or nominating another member is requested to notify Michael Hayden, CCSC

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Secretary, by October 21, 2011. Please use the following e-address: ccsc.secretary[insert at sign]soarccsc.com

Adjournment

The meeting was adjourned at 12:59 p.m. by unanimous consent.

Pop Quiz Answers

1 FAR part: definitions

1 mile vis and clear of clouds req'd in Class G airspace

2 years between flight reviews (biennial)

2 degrees C, standard temperature lapse rate per 1000'

3 landings in last 90 days in category and class to carry passengers

3 miles visibility required for flight in controlled airspace

3 spacing between cloud streets is typically _____ times the height of the clouds

3.5 degrees F, standard temperature lapse rate per 1000'

4.4 (temp - dewpoint) / _____) x 1000 = approx height of cloud bases

4.67 Gs, 2-33 limit load factor

5 \$, rental fee of 2-33

8 recommended max number of tows before refueling a Pawnee

9 \$, youth member dues

12 months between annual inspections

14 minimum age to solo in a glider

15 psi, 2-33 tire pressure

15 degrees C, standard temperature at sea level

16 minimum age for a private license in a glider

18 minimum age for commercial license in a glider

18 \$, member dues

19.5 pounds, weight of 2-33 removable ballast

23:1, 2-33 best L/D

24 months between flight reviews

24 months between transponder inspections

29.92 standard altimeter setting in inches of mercury

30 days to report change of address to FAA

31 2-33 stall speed, solo

34 2-33 stall speed, dual

36 cents per 100 feet tow charge

38 2-33 min sink speed, solo

42 2-33 min sink speed, dual

43 FAR Part: covers aircraft maintenance

45 2-33 best glide speed, solo 50

2-33 best glide speed, dual

51 feet, 2-33 wingspan

59 degrees F, standard temperature at sea level

60 days to report DUI to FAA

61 FAR Part: certification of pilots

65 2-33 maneuvering speed, max gross wt

69 2-33 max speed for winch tow

71 FAR Part: designates types of airspace and reporting points

78.2 2-33 CG forward limit

80 min % of rope strength to glider GW

80 \$, intro flight fee

86.1 2-33 CG aft limit

90 days for landing currency

90 series advisory circulars cover ATC

91 FAR Part: aircraft operation rules

98 2-33 max speed

98 2-33 max aerotow speed

100 hours required in category, class and type (if required) to tow a glider

100 hours max between inspections of commercial-use aircraft

111 2-33 min front seat weight, solo, with ballast

123.3 radio frequency at the gliderport

129.9 radio frequency at Red Stewart Field

154 2-33 min pilot wt, solo, no ballast

200 max % of rope strength to glider GW

432 pounds, 2-33 useful load

500 feet clearance below clouds in controlled airspace

608 pounds, 2-33 empty weight

700 AGL base of class E airspace near most IFR-use airports

940 CCSC field elevation

1000 feet clearance above clouds req'd in controlled airspace

1000 foot ceiling req'd for basic VFR weather in controlled airspace

1013.2 standard altimeter setting in millibars

1040 pounds, 2-33 max weight

1200 AGL base of class E airspace over the gliderport

2000 feet cloud clearance req'd horizontally in controlled airspace below 10000 feet

2800 feet, length of runway at CCSC

12500 more than _____ pounds gross weight requires a type rating

18000 flight level, start of class A airspace



*Fred Hawke, Christian and Norb Maurer
Tow Pilot's and a traniee, 2nd Sun Crew*

Grob 0, Signpost 3

by Steven Statkus (Safety Committee)

The instructor was PIC and flying the G103 on the last flight of the day. Soaring conditions had deteriorated by the time he entered and performed his usual pattern to land long on runway 27. Weather conditions were favorable, meaning no cross wind to worry about as he lined up on the north side of runway 27 and proceeded to glide to a smooth touchdown and began his rollout. At some point during the roll out the pilot became concerned with his proximity with the tree line and began to maneuver the aircraft away from the tree line. His effort failed to gain separation from the tree line as the rollout lost energy. At approximately 100 feet from the entrance to the paddock or marshalling area the right wing must have contacted the ground causing the glider to begin a smooth right hand turn which resulted in contact with right wing and the sign located to the east of the chute into the paddock area. This caused the glider to pivot around the sign and come to rest in the chute with the nose pointed into the paddock. It is important to note that the pilot was not attempting to taxi into the paddock but stop short of the chute to expedite retrieval.

This preventable accident began with the decision to land on the north side of runway 27. The consequence of this decision was the proximity to the tree line followed by a delayed decision to attempt

separation from the tree line until insufficient control authority existed to affect the desired change in direction.

What did not happen, but what has happened in the past and recently, is that pilots

flying club gliders have attempted to taxi into the paddock through the chute. So far this practice has been successful but the Grob repair bill will tell us what the consequences are if they are unsuccessful. Private pilots flying their own birds may perform these maneuvers of skill and daring but club members flying club owned gliders are asked to avoid risking our equipment in such a manner.

Lessons learned:

- Landing long demands preplanning and attention to orientation on final. It's a better decision to depend on the golf cart to remove the glider from the center of the runway rather than risk hitting stationary objects.
- Even experienced pilots make questionable calls from time to time. To reduce the risk of people observing your wrong call, practice precision flying when in the pattern. "A good landing begins with a precise down wind leg." Gabe 1992.
- The signpost has claimed it's final victim.



High Pucker Factor on Tow

by Steven Statkus (Safety Committee)

High density altitude, heavy weight glider, short runway, zero headwind, and the proverbial 50 trees all came together to form the perfect storm. As the trees approached it was superior airmanship coupled with a large dose of luck that saved the day.

The tow plane was 48L and the glider was the Grob 103 with two adult sized pilots aboard. Aware of the prevailing conditions the tow pilot elected to perform a short field take off, the student pilot in the glider did not. The tow began and at the club house the Pawnee became airborne. The pair cleared the trees at the west end of the field with 45 kts showing on the Grob's ASI. Once clear of the trees the tow pilot nosed over and flew down the valley building airspeed and eventually climbing out into a right down wind. The glider released adjacent to the clubhouse at about 700 ft AGL. Both aircraft landed safely

Lessons learned:

- Density altitude, density altitude, density altitude;

it's not just for tow pilots; glider pilots need to become aware of these conditions also and their effects on aircraft performance. As density altitude increases (due to high temperatures and humidity) the power developed by the Pawnee's engine decreases. Less power means slower acceleration, a longer takeoff run, and a decreased rate of climb.

- Since Mother Nature provides the conditions we fly in and we can't change Mother Nature, we can take some steps to mitigate her effects and change the ratio of airmanship/luck to a number more to our liking; (more airmanship, less luck.) And, it's not completely up to the pilots either. Crew chiefs and aircraft maintenance folks can help change the calculus.
- If the day's conditions will include high density altitudes, crew chiefs should be aware and discuss the grid alternatives with the tow pilots. They may elect a slight tail wind on takeoff as opposed to facing the 50 foot trees. Stretch the runway to the max. Glider pilots should attempt to get the glider in the air as soon as possible. Pawnees accelerate faster towing a glider in the air than on the ground. A glider begin pulled across the ground can generate around 100 lbs of drag. As

soon as the glider breaks down the drag is reduced to somewhere between 20-25 pounds. On smaller fiberglass gliders, the drag can be as low as 15 lbs. So soft field techniques and getting the glider off the ground is always the first order of business. Both tow pilots and glider pilots need to think about where and when they would pull the release if the takeoff roll seems long and slow.

The maintenance guys have begun 100 hour engine inspections: compression checks, mag timing checks, intake filter and prop cleaning. Proper tire inflation on the both glider and tow plane will help the take off performance. Check for full inflation before pulling a glider out of the hangar.

This event is now one of those "I remember this one tow," stories rather than an article in the Enquirer due to clear correct thinking throughout the tow on the part of the tow pilot and airspeed control on the part of the glider instructor.

Thanks to the folks involved with this event for their contributions to the detail and accuracy of this article. It is the open and honest sharing of events such as this one that will go a long way to improving our clubs' safety record.

How Our Tow Planes Are Tuned

by Paul McClaskey (CCSC President)

[Editors Note - This is an excerpt from a recent email sent to all tow pilots but it was felt that dissemination of this topic and information to all club members would be of benefit.]

Regarding complaints about 48L having low towing performance, especially with heavy gliders, I have done a fair amount of investigation into the issue. First of all, let me state that the engine is inspected quite thoroughly at the annual inspection. I believe the annual was done in May this year. During that inspection the engine oil is changed, the oil and fuel filters and screens are inspected for contaminants and cleaned, the spark plugs are inspected and cleaned, the ignition timing is checked, the compression is checked, the air filter is replaced and the idle mixture is checked and set. The engine is run up before and after the inspection. This is typically what it takes to determine the airworthiness and serviceability of the engine. This process was repeated on all the towplanes during the last month or so after the performance complaints on 48L were voiced.

In spite of all these tests and checks, there is really only one method of determining whether or not the engine is making adequate power or not, and that is a static run-up. For each engine/propeller combination,

the FAA sets forth the minimum and maximum static rpm range in the aircraft's type certificate data sheet. For the Pawnee with the Lycoming O-540 engine and McCauley 1A200 prop the specification is 2,250 to 2,350 rpm with no additional tolerance permitted. This test is done by applying full throttle while the aircraft is stationary and observing the resulting RPM. PLEASE DO NOT ATTEMPT THIS IN THE PAWNEE AS THE AIRPLANE WILL END UP ON ITS NOSE! In order to do this test the tail must be properly tied down or weighted to prevent wrecking the airplane.

Last weekend, I inspected the engine in 48L for any obvious problems and found none. I performed the static run-up and found the static RPM to be 2,300 rpm, exactly in the middle of the specified range. I did this measurement with an electronic tach, but the tach in the airplane appeared to be right on at high RPM. You might be thinking that it was nice and cool last week and therefore the engine should perform well under those conditions. However, the same factors that reduce engine performance on a hot day also result in reduced loading on the engine by the prop. The end result is that the factors cancel each other out making the static run-up a valid test regardless of density altitude. I flew 48L for an hour or so and then did four K-21 tows with two big guys in the glider each time and I thought the aircraft performed just fine. The engine turned 2,300 RPM upon the initial application of power and ran a steady 2,450 RPM while towing at 70-75 mph. It was a smooth day and the climb rate was a solid 500 fpm. Therefore, I removed the red tag. Just for the record, I did all this under the supervision of Cub Stewart.

During discussions with people about the performance issues, a few people noted that they could get a higher RPM if they leaned the mixture during tow. I am sure that they are correct, but this is very hard on the engine. Carbureted piston engines have an a valve in the carburetor called a power enrichment or economizer valve that artificially enriches the mixture at high power settings. The mixture is actually richer than it should be for maximum power. This extra rich mixture does three things; it lowers the cylinder head temperature and thus also keeps the valves cooler, it prevents detonation and it slightly lowers the power the engine might produce without this extra fuel. Leaning the mixture on takeoff and high power climb will result in cylinder head temperatures approaching the limit of 500 F, damage to the valves and a risk of detonation, all of which will destroy the engine in short order. The engine is rated for 235 hp at sea level with the mixture full rich. Please don't lean it out during takeoff and climb.

Thanks to all the tow pilots who make our operation run and all those who provided help or counsel while the problem was worked.