

GA FEEDBACK

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EDITORIAL

We received a number of comments and queries in response to the item 'Carbon Monoxide' in Issue 4 of GA FEEDBACK. In response to these, we have sought information on accident data and have also sought the advice of a UK manufacturer of carbon monoxide (CO) detectors.

Accident information available on the US National Transportation Safety Board web site: www.ntsb.gov/aviation details four accidents in the last two years in which CO inhalation was determined to be a principal causal factor. The CAA (SRG) database contains six reports of CO contamination, all involving the same aircraft type and attributed to an inadequate canopy seal.

More detailed information on this subject is available on Avweb, an aviation magazine and news service: www.avweb.com. This site gives information on chemical spot or 'Dead Stop' detectors, and suggests that agents other than CO may affect this type of detector. In particular some aromatics can react with the spot and give a false indication. Perhaps more insidiously, the reaction may not produce a change in colour of the spot but will render it useless for subsequent detection of CO. For example, some cleaners and solvents commonly used for aircraft interiors will affect some spot detectors.

If 'Dead Stop' detectors are used they must be changed in accordance with the manufacturers' recommendations. Some types recommend replacement every 30 days, others every six months. Available evidence suggests they may be unpredictable and should be treated accordingly.

More expensive detectors give staged warnings and some offer audible as well as visual warnings. The British Standards Institute has established criteria for reliability and repeatability and awards its Standard to equipment complying with the requirements.

A number of reporters suggested that the detector described in the report may have given spurious or premature warnings. Others have questioned the presence of CO and have suggested that hyperventilation may have been the principal cause. It has not been

possible to ascertain the actual post-flight blood gas levels and it is possible that other contributory factors might have been involved. Notwithstanding this, whatever the cause, on receipt of any warning of this type the safe course of action is to land as soon as is safely possible and sort the problem out on the ground.

CHIRP HAS RELOCATED

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Many human error incidents occur when our normal routine is interrupted or changed. In these circumstances, making the time to carry out a thorough check is a most important safeguard:

(1) A SMALL ERROR - AN EXPENSIVE RESULT

Prior to starting the engine, I forgot to turn the fuel on, so after taxiing for a few seconds the engine stopped.

I turned the fuel on, switched the ignition off and exited the aircraft and prepared to restart. Having pumped the fuel up and put the ignition switches and brakes on, I swung the propeller. The engine fired instantly and ran at a high power setting. The aircraft started moving against the brakes. I grabbed the wing but could not hold it and the aircraft got away gathering speed. The tail rose high and the propeller struck the ground disintegrating as the nose dug in, flipping the aircraft upside down and hitting both wingtips as it did, finally coming to rest upside down.

No one was hurt, although my "pride" is a write-off as I forgot to check that the throttle was shut.

GA FEEDBACK is available on the internet at www.chirp.co.uk

A General Aviation Safety Newsletter

from the Confidential Human Factors Incident Reporting Programme

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(2) UNLATCHED

I had flown a modern, composite motor glider on a short local flight from my home airfield to one about half an hour away, with a passenger who had not flown before. Parking was on a grass area, just off the perimeter track. After a cup of tea, on returning to the aircraft, I noticed that the wheels had sunk slightly into the soft ground, and that there was a very shallow lip up onto the tarmac of the perimeter track. I wondered if the motor glider's engine would have enough power to take the aircraft, two up, onto the tarmac.

We climbed aboard, went through all the checks, and fired up the motor. After completion of the engine checks, I released the brakes and attempted to reach the tarmac, attacking it at a sharp angle so that the wheels would not leave the grass at the same time. The first wheel mounted the tarmac without difficulty - so far so good - but the second stuck fast at the lip and I could not budge it with the controls.

I therefore shut the engine down, undid my belts, opened the canopy, got out and levered the second wheel onto the tarmac with one wing. I regained my seat, fastened my belt, and proceeded as usual to the hold, lined up and took off. No sooner had the aircraft left the runway than the canopy popped open. Fortunately, it is forward-hinged, but creates significant lift, and was therefore being pulled open. At the same time, it was being prevented from opening fully by the airflow. I quickly realised that the aircraft could fly in this condition, and continued the climb-out, my daughter hanging on to the canopy latch, having decided that to land ahead in what was left of the runway presented a much greater risk.

I decided to stay in the circuit, tell AFIS that I had a slight problem and would land back. I did so, locked the canopy, took off again and returned to base, none the worse for the experience but having learned the lesson that, if you break the sequence of the pre-departure checks, such as by leaving the aircraft temporarily, you must go through all the checks again from the beginning. In this instance, I failed to re-check that the canopy was locked after I had re-boarded.

It is equally important to perform a thorough pre-flight check on gliders after rigging

(1)

A Slingsby glider was being rigged prior to the start of a glider rally. More people were helping than were actually required. Several of the helpers attached the tailplane and then fitted the spine fairing cover.

The glider was moved to the launch point. On carrying out a pre-flight control-check, the pilot found that the elevator was not connected. The pilot had not removed the spine fairing having assumed that the fairing would not have been fitted if the controls had not been connected.

Wrong!

(2)

I am a fully rated gliding instructor and also an inspector for the British Gliding Association.

During a recent visit to a gliding club, a member was rigging his glider, which had just returned from an Annual C of A Inspection. This was to be its first flight after C of A. The owner was inexperienced on type having only recently acquired the aircraft and was obviously enthusiastic to fly it. He carried out a normal DI and I offered to carry out an independent rigging check, with a positive check of all control connections.

This check revealed that although the airbrake lever operated normally, the airbrakes, which are upper surface paddles, were opening differentially. The starboard paddle was opening normally but the port paddle was reluctant to open.

I assisted the owner to de-rig the glider in order to investigate and found the following:

1. The drive rod from the wing root to the port airbrake paddle had been damaged and was bent. As the rod was placed under load it bent considerably preventing the port airbrake paddle from opening.
2. In the fuselage centre section the airbrake drive circuit had obviously been adjusted but the lock nuts in the circuit were not tight. They could be moved by finger pressure.

The aircraft was returned to its trailer with a view to returning it to the engineering facility responsible for the C of A Inspection.

Had this aircraft flown without positive/independent checks, an inexperienced pilot would have been in a difficult position near the ground in the approach phase when he opened the air brakes. The glider would have probably rolled and yawed to the right at low level. The dangers are obvious.

The lessons the owner learned from this are:

1. Always have an independent check made after rigging your aircraft and include a positive control check.
2. Do not assume there are no faults with your aircraft after its annual C of A. Engineers are not infallible.

A principal causal factor in many take off and landing accidents and incidents is inadequate knowledge and/or consideration of the effect of the prevailing conditions on an aircraft's performance. The often expensive and occasionally more serious consequences of this type of occurrence are almost always avoidable.

(1) SOFT GROUND ... HARD LESSON?

I operate a Stemme motor-glider out of an 800-yard grass airstrip in a valley, with trees at each end, creating an obstacle clearance of 50-75 feet. On the day in question I took off in no wind in 350 yards with an all-up-weight of 1710 lbs., clearing the airfield boundary comfortably. After some local soaring I landed at a nearby gliding site, and, a short time later, prepared to take off on a grass strip 500 yards in length downhill with no obstacles to clear.

There was a light headwind of 2-5 knots, but the all-up-weight had increased to approx 1800 lbs with the addition of a second pilot. The initial take off run was predictably slow due to the weight and relatively small main wheels. At the halfway point I lifted the tailplane, 30 knots indicated, continuing to unload and accelerate the aircraft. At approximately the 400-yard mark we started to decelerate. I immediately reacted by easing back on the stick, and then throttling back to abort as the tailplane, which by now would not fly, touched the ground and bounced upwards pitching the aircraft forward, in spite of the stick being held fully back. The propeller then struck the ground. As the tail came down again I executed a sharp turn to starboard to expedite the stopping of the aircraft, finishing the ground run 150 feet from the airfield boundary.

I shut down the aircraft and retraced my steps to determine the course of events, which were clear to see. The main wheels had sunk into soft ground to a depth of 1" for 40 yards; this had accounted for the deceleration. The tailwheel had touched the ground on an old hedgeline mound on the rising side, the tyre penetrating the soft ground 1" for approximately 2 feet. After a further 15/20 yards the first of the propeller strikes had marked the ground for some 10 yards. The damage to the aircraft was to one half of the tip of a two-blade folding propeller. A subsequent full inspection, according to the manufacturers' flight manual, revealed no further damage, and no shock loading due to the pulley belt reductions, clutch and gearbox design, the engine being mounted behind the pilots with a carbon fibre propshaft running forward.

Conclusion

I wrongly assumed, despite being familiar with the field, that the bottom end was dry and well drained on account of the slope. I should have walked and inspected the take-off run, although this may well not have revealed the soft patches as a few yards on either

side was firm. If I had discovered this wet area, I would have either altered the take off direction, or gone out one-up.

Cause of the accident - Pilot error.

(2) A WEIGHTY PROBLEM

I had arranged to do some pottering about in the local flying area, with the probability that I would drop in, so to speak, at a very small strip, where there is a small hotel at the end of the runway. It's a very popular watering hole for flyers, and I knew there was a good chance that I might meet one or two friends, and their aircraft, there.

I needed fuel, so I filled right up before leaving my home base, knowing that I was flying solo. With two up, the Manual states that only three-quarters fuel should be carried. I took off, and a short time later was overhead the strip with the hotel. I noticed that one of the aircraft that shares the hangar in which I keep mine was parked there, so I decided to land. I found that my friend had brought a passenger with him, a very rare occurrence, as he is a lone flyer by nature, and the capacity of his side-by-side two-seat 3-axis microlight is very limited.

My friend suggested that his companion, who was mad about flying, fly with me back to our base, taking the "long" route home to view some more of the local scenery, and we would meet up at the hangar. I readily agreed.

Now "base" is a 1200m tarmac runway, while the grass strip we were at is much shorter at less than 800m. I had never had any problems landing or taking off, and I had no reason to think that now would be any different. I made a mental note of the fact that we were on slightly damp grass, so expected one of the longer take-off runs, and plotted the probable lift off point. However, when we were beyond the normal point of lift off in these circumstances, and were still not airborne, although the ASI was showing normal speed, a twinge of anxiety shot through me. However, I managed to coax the little aeroplane off the deck, and, free of the drag of the wheels on the grass, it began to climb, but ever-so-slowly. Fortunately, there is ample space on that particular climb-out, but it was not until we were settled in the shallow climb that I realised that I had taken a passenger on board, having just filled the fuel tank and not burned off anything like enough to bring the all-up weight within limits.

I learned to check my all-up weight every time I prepare to depart, whatever the distractions of the moment.

(3) UNSTABLE APPROACH

I had completed three practice circuits in a microlight to touch and go landings on a grass strip at an airfield in light wind conditions.

I made a further approach in the opposite runway direction, but found myself too high. I tried to lose height with S-turns, but landed long. I applied the nose wheel brake, but the wheel locked and the aircraft overshot the end of the strip, colliding with a runway lamp on a concrete plinth that was concealed in long grass. The speed on impact was about 5mph; the nose wheel detached and the propeller struck the ground stopping the engine, although remaining intact. Fortunately, I was uninjured.

Cause: Pilot error. I underestimated the effect of the steep approach (can't side slip no ailerons) and misjudged the braking action.

(4) SMALLER - YES, SLOWER - NO.

Due to the field being smaller than I was used to, I flew my microlight in more slowly than normal. When crossing the boundary of the field at a point shielded by trees, I lost the wind or airflow and stalled in from about 10 ft.

My passenger and I had no injury but the plane is possibly a write off.

The CAA General Aviation Safety Sense Leaflet No 7B - 'Aeroplane Performance' contains advice on many aspects of take off and landing performance. Leaflet 12C 'Strip Sense' contains additional advice on operating from grass strips.

In relation to the preceding reports, the following information is worthy of consideration:

- *Take off distance to 50 ft can be expected to increase by at least 25% if the ground is soft. Similarly, an allowance should be made for a 30% increase in take off distance to 50 ft if the grass is wet.*
- *Where several factors are relevant they should be multiplied*
- *On many aircraft it may not be possible to fill all the fuel tanks, all the seats and the baggage provision without exceeding the maximum take off weight.*
- *Even a slight tailwind increases the take-off and landing distances very significantly, particularly in aircraft with low approach speeds. When assessing takeoff and landing distances, use only 50% of the*

headwind component, but not less than 150% of the tailwind component.

- *An important factor in achieving a good landing is a good, stable approach. If you misjudge the approach, make an early decision to go around and set yourself up again - it is the safer and, sometimes, the cheaper option!*
- *Always fly at the recommended approach speed for the type to preserve an adequate margin from the stall. This technique will also provide protection from unusual wind effects caused by trees, terrain, buildings and thermal activity.*
- *Be prepared for turbulence and/or windshear.*

THE RIGHT PRIORITY

It was a few years ago and I was a brand new PPL, recently converted to a high performance single. Out over the sea, heading towards England on a beautiful crystal clear morning. Suddenly I notice a warning light and on checking see the alternator isn't charging. I call Air Traffic Control and tell them I am returning to base, 10 minutes away. As I do so, the radio goes down.

My reaction is to get the wheels down, but that kills everything and they don't go down. Now all the electronic instruments have disappeared. On this aircraft there is a second alternator, linked to an air-conditioning unit, which can be switched to power the aircraft batteries. But I have been advised not to use the air-conditioning until I am more familiar with the aircraft and I don't know how to switch on the alternator. I fumble for the aircraft manual and start trying to read and fly. It doesn't work, I am flying erratically. I try the handheld radio, but while ATC can hear me, I cannot hear them above the noise of the engine, without my earphones.

Then I hear the voice of my instructor, over and over when I was learning. "Always remember, first priority: fly the plane". I throw the book into the back seat, calmly use the manual wheels-down levers, get back in control, inform the tower of my intentions in joining the circuit and make a perfect landing - but with no flaps, a fast one.

"Oh you're back", says someone as I walk from the engineering shed, "Your CFI saw you land and said it was much too fast." "That CFI just saved my life", I muttered.

Lessons: Fly the Plane; learn every possible emergency procedure; carry an adaptor for your headset so it can be used with a handheld radio.
