GASIL

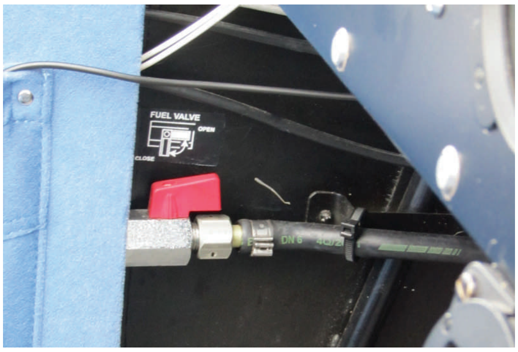
General Aviation Safety Information Leaflet

Civil Aviation Authority

www.caa.co.uk/gasil

Issue no. 02 of 2012

Too rich?



The AAIB's Bulletin 10 of 2011 includes a report of an accident to a EV-97 Eurostar. It seems the pilot had difficulty starting the engine, and was experiencing canopy misting which was undoubtedly a distraction. Having used the choke during the start procedure, he apparently decided he had over-fuelled the engine so, to weaken the mixture for a further attempt, he selected the fuel cock OFF. When he did line up for take-off, the engine failed at about 10 feet, and he was unable to prevent the aircraft over-running the strip end and striking obstacles.

GASIL articles in the past have highlighted the fact that the fuel systems in many aircraft will provide enough fuel for a short taxi and take-off, even if the fuel cock is selected OFF. However, the extra fuel required at full power rapidly empties the lines, and the engine is likely to stop at a critical phase of flight. Whatever the distractions or hurry, pre-take-off vital actions are intended to identify and resolve any previous incorrect selections. They must be carried out carefully, and with the expectation that we shall find something wrong during them.

Runway clear for liftoff?

In Issue 10 of last year we reminded pilots that public roads and paths are often found close to runways at aerodromes and warned that obstructions in the form of vehicles moving into a runway undershoot were a hazard. We did not mention railway trains, but there are several aerodromes with tracks passing close, and passing trains should also be considered, not only as obstacles but also as containing possibly concerned members of the public. Although in the case of a licensed aerodrome a normal approach should pass well clear of such obstacles, unlicensed strips may have no such protection, and even at licensed aerodromes an unusual approach, such as a landing before the marked threshold, may reduce the margin for safety.

Of course, any possible obstruction on the approach to one end of a runway is also a possible obstacle on the climb after take-off in the other direction, and it is often difficult to spot a vehicle or train approaching the climb-out lane. Take-off performance calculations are intended to provide at least a 50 foot clearance from any obstructions. However, if a pilot overloads his aeroplane, or the aircraft does not achieve the expected performance, the safety margin is likely to be eroded. We must also remember from a practical viewpoint that many members of the public would consider being 50 feet below a passing aircraft to be dangerously close.

Another way to erode the safety margin would be to commence the take-off roll from a point closer to the runway end than the performance calculations expected. Most pilots would say they would never do that, but what about a touch-and-go landing? It is tempting for an instructor to allow a student to touch down a long way up the runway in order to gain essential practice at the landing itself. However, the climb after the subsequent take-off may well be a lot closer to the obstacles below it than is safe. Pilots and especially instructors should consider the subsequent climb-out when planning touch-and-go landings, and fly an early go-around as soon as a touchdown in the correct place becomes unlikely. After all, that is what we should all be doing, and teaching!

Props

We recently learnt of yet another fatal accident in this country when a human came into contact with a moving light aeroplane propeller. Whatever the eventual conclusion of the investigation, we must all remember that a moment's inattention can be fatal.

We should also remember that no-one is immune from slips and lapses. Never assume that anyone, however experienced, has noticed a hazard. Much better to shout an unnecessary warning than regret the failure to do so.

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Reducing collision risks

SafetySense leaflet 13 "Collision avoidance", available like all such leaflets free for download from the CAA web site www.caa.co.uk/safetysense, recommends methods of scanning outside the cockpit in order to spot other aircraft. However, it is difficult, and tiring, to maintain such a lookout scan for a long time. If we are aware when and where a collision is most likely, we can concentrate our attention at these times and places. The leaflet and other material warn us that collisions are most likely where aircraft are concentrated.

The circuit pattern, as illustrated in SafetySense leaflet 6 'Aerodrome Sense' and in the poster 'Standard "Overhead" Join', is an obvious concentration area. Look out and listen out to identify all other aircraft ahead and around before joining the pattern and maintain awareness of all of them. Make your own calls clear, concise, and in the correct position. Fly accurate heights; an aircraft turning at the same altitude is easier to see than one below you. Finally, never anticipate others doing what you would do – always expect a threat from outside your normal pattern.

Be wary near microlight sites, and aerodromes where circuit traffic may extend outside the ATZ if there is one. Take especial care near aerodromes where instrument approach training may be taking place. Listen for such traffic and announce your presence if possible. Similarly, remember the hazards of flying over and near parachute drop zones and glider sites.

Many modern aircraft, including most gliders, are predominantly white. That colour provides little contrast against the sky, especially against the puffy cumulus clouds which are often found above the thermals glider pilots use to gain height during the spring and summer months. Sunlight glinting on wings as an aircraft circles can often indicate its presence, but cannot do so if cloud comes between the aircraft and the sun. Glinting is also unlikely if an aircraft is cruising.

Probably even more than aeroplanes and helicopters, many gliders fly long distances away from their bases, and while a glider's airspeed during a climb may be slow, between climbs many can cruise at speeds faster than some light aeroplanes. Glider pilots tend to cruise where rising air is most likely. Seldom turning, they may use mountain and lee wave at high altitudes throughout the year. They will often cruise under a line of cumulus clouds, usually but not always towards the sunny edge of it. Such a line may not be immediately obvious to a power pilot, but gliders will generally avoid any large gaps between cumulus clouds.

Collisions are most likely where aircraft are 'funnelled' into narrow areas between restrictions, whether natural or artificial. Even though crossing controlled airspace is possible, almost every light aircraft flying across country will at some time have to pass through a narrow gap between Control Zones or ATZs. These are often restricted further by controlled airspace above. Gliders passing through the same 'funnels' will seek rising air over obvious thermal sources such as power stations.

The better the weather forecast, the more pilots are encouraged to fly, the more congested the 'funnels' become and the higher the risk of collision. Even in good visibility, we are unlikely to see another aircraft until it is less than 3 miles away, so we need to keep our eyes outside the cockpit. Poor in-flight visibility may prevent us seeing another aircraft until it is closer, but it is possible that same poor visibility may discourage others from flying and make the availability of a Traffic Service from an Air Traffic Control Unit more likely. Of course, if we fly above the haze layer (or the tops of any cumulus clouds) in the summer months, we not only increase our in-flight visibility, but we are much less likely to encounter a glider, since thermals do not go above that.

At these times, and in these places, the threat of a collision is probably at least as great as that in the circuit pattern, where recent fatal accidents have reminded us the risk is particularly high. As part of our pre-flight planning, we should try to identify high-risk areas and times, so that we can reinvigorate our scan pattern at appropriate times during the flight.

Fuel storage

Questions have recently been raised concerning the storage of fuel for aircraft use. Article 217 of the Air Navigation Order 2009 gives detailed requirements for the manager of an aviation fuel installation at an aerodrome. Since "any area of land or water designed, equipped, set apart or commonly used for affording facilities for the landing and departure of aircraft" is an aerodrome, these requirements would appear to apply anywhere fuel intended for use in aircraft may be stored. In any case, no aircraft owner or operator would wish to use fuel in anything other than top condition, so that fuel should be fully compliant with a recognised Aviation (or, if approved for use, Motor) Fuel Specification and handled in full compliance with a set of robust procedures reflecting current Standards and industry "best practice". Note that Motor gasoline (MOGAS) can only be used if the aircraft/engine combination has been specifically approved to do so. SafetySense leaflet 4 contains guidance on its use, and information on the types of aircraft which have been approved by the CAA to use leaded or unleaded MOGAS is in CAP 747 *Mandatory Requirements for Airworthiness*, Section 2, Part 4, Generic Concessions (GC) No. 2, 3, 4 and 5, which also contain the fuel specifications and operating restrictions.

CAP 748 "Aviation Fuel and Fuel Installation Management", is available like most CAPs free for download from www.caa.co.uk/publications, and provides basic guidance for anyone managing a fuel installation. Much of the content may appear to apply only to large aerodromes, and ANO references are to an earlier (2000) edition of that Order. However, it does contain useful guidance on many general and specific points which apply equally to smaller sites and to the aircraft owner who keeps fuel such as Jet A-1 or even MOGAS in a tank at a strip or in his garden. The chapter on risk assessment should be of especial interest.

CAP 748 mentions the need to prevent contamination or deterioration of fuel during storage, and gives guidance on recognising these problems. However, for preventive measures, readers are referred to formal petroleum industry guidance material, such as "Guidelines for Aviation Fuel Quality Control and Operating Procedures at Smaller Airports", published by the Joint Inspection Group www.jointinspectiongroup.org.

When fuel usage is forecast to be low, . . keep containers as close to 90% full as possible

For most small enterprises or individuals, the oil company fuel supplier was historically the most appropriate source of guidance, but recent changes in the organisation of fuel distribution and supply have led to a reduction in their involvement and supportive resource. Fuel installation managers are increasingly having to make their own determinations on all matters concerning fuel storage, handling, testing and dispensing by reference to published information sources.

Preventing fuel contamination requires the container (tank, bowser, jerrycan etc), and all parts such as hoses, seals and liners, to be of good quality materials which will not be affected by the fuel to be contained, and for aviation fuel the apparatus must be of a type, specification and manufacture specifically approved for that product. The apparatus, container and its parts must be kept scrupulously clean with no chance of having been contaminated by other liquids. For example, do not use a jerrycan which has previously contained Jet fuel (or anything else) to transport AVGAS. There should be no way for water from rain or snow to enter the container or the fuelling system. Regular inspections of the fuel product, containers, and dispensing systems must be performed systematically by trained and competent personnel in order to detect contamination or deterioration. If any is found, flight safety requires the correct actions to be taken.

Fuel in contact with air will deteriorate with time, and condensation of water vapour will contaminate the fuel below. Fuel systems containing Certified fuel, and subject to robust routine checks and regular use, will generally perform well, but problems with fuel and equipment degradation can affect a system which is being seldom used.

Containers **must** always be kept closed, but must not be filled above 90% to allow for expansion, and even in ideal conditions 'shelf-life' should not exceed 3 months for Avgas and 6 months for Jet A1. Whilst much is dependent on the condition of the container and the prevailing atmospheric conditions during storage, the likelihood of significant fuel performance degradation is real. Specialist advice should therefore be sought from the appropriate fuel professionals before dispensing fuel that has been in static storage for longer than those periods to an aircraft.

It is recognised that economic issues may encourage owners to keep their supplies of fuel at a minimum during periods of inactivity. However, if stocks in tanks are allowed to drop and remain low, the fuel at the bottom of the tank may depart from specification, affecting the quality of the whole tank when it is re-filled. A full tank is less likely to suffer either deterioration or water contamination. When fuel usage is forecast to be low, such as during winter or long-term restrictions of flying such as the Olympics, owners are encouraged to keep fuel containers as close to 90% full as possible.

Gusts

We frequently advise pilots to make their final approach at the manufacturer's recommended speed, and if none is published to use a speed corresponding to 1.3 times the aircraft stalling speed in the approach configuration. We should all be aware that, while too slow an approach may induce loss (or at least a reduction) of control or even a stall, too fast an approach can cause over-controlling in the flare, or over-running the landing surface.

However, when the surface wind is strong (or gusting), we need to consider other factors. A high or gusting wind from ahead will be affected by friction, and the wind affecting the aircraft at a few hundred feet will be stronger than at the surface. The effect of a changing cross-wind will be to alter the drift experienced, so there should be no need to change the aircraft's speed on the approach to compensate. However, a changing head-wind component will combine with the aircraft's inertia (the tendency to maintain a constant groundspeed) to frequently produce a reduction in airspeed just above the ground.

To compensate for this expected reduction in airspeed before touchdown, it is advisable to increase the approach speed by at least 1/3 of the head component of the reported surface wind speed. If gusts are reported, add the difference between the average speed and the gust. Doing so may increase the landing distance, but it should mean that when (as is likely) the airspeed drops suddenly just above the ground, the pilot still has sufficient control for the flare.

Emergency ADs

EASA produces bi-weekly summaries of the ADs they have issued or approved, which are available through their website www.easa.eu. Foreign-issued (non-EU) Airworthiness Directives are also available through the same site, as are details of all recent EASA approved Airworthiness Directives. CAA ADs for UK manufactured aircraft which have not yet been incorporated in CAP 747 can be found on the CAA website http://www.caa.co.uk/ads.

We are aware that the following Emergency Airworthiness Directive has been issued recently by Transport Canada; however, this list is not exhaustive and must not be relied on.

Number	Applicability	Description
TC CF-2011-44R1	Bell Textron Canada 206L	Main rotor blade

Mayday

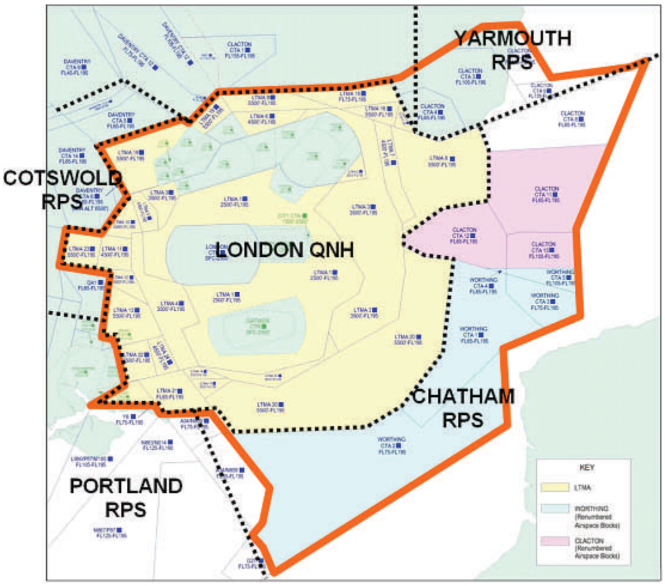
Question - If you hear the word “MAYDAY” on the radio, what’s the first thing you do?
Answer – Keep quiet!

Question – What else?
Answer – Note down the details of the call, so that if no Air Traffic Service Unit replies, you can relay the message accurately. Don’t worry if you can’t remember the exact format as given in CAP 413, but perhaps we could all refresh our knowledge from www.caa.co.uk/cap413 ?

An airline crew were able to do exactly that recently, providing essential relay facility for a GA pilot in trouble.

6,000 feet Transition altitudes

Although the Transition Altitude in UK airspace is generally 3,000 feet, that is not the case within and beneath certain Controlled Airspace, and this has been the case for some time. Last year, the Transition Altitude within and beneath the Class A Airspace of the Birmingham, East Midlands and Daventry CTAs was raised to 6,000 feet, and with effect from 8 March 2012, a similar Transition Altitude of 6,000 feet is to be applied to airspace within and below certain sectors of the Worthing and Clacton CTAs. Where the base of these sectors is now defined as an altitude, pilots flying in the vicinity should set the QNH, which they can obtain from a nearby aerodrome, as advised in GASIL 3 of 2011.



In the past, pilots who have been unable to follow the Visual Flight Rules have been able to obtain a measure of collision avoidance by crossing beneath these CTA sectors by climbing above 3,000 feet, setting 1013 hPa, and flying at the appropriate Quadrantal Flight Level. Such Quadrantal Levels are currently only available above the TA.

We continue to recommend that those pilots needing to transit under such controlled airspace, particularly when flying IFR, should consider obtaining a radar service from a nearby LARS or other Air Traffic Control Unit before doing so. However, a full service may not be available, so that pilots should also consider following the same Quadrantal principles as before, but flying at the associated altitude with an appropriate setting on their altimeter.

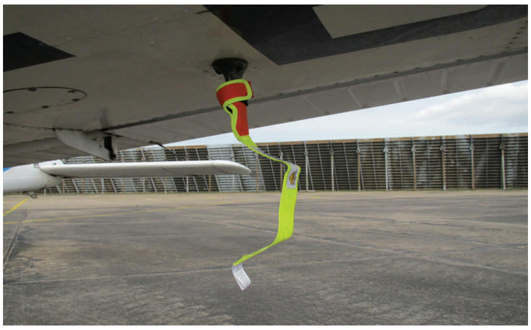
However, the situation is complicated under those sectors of the Worthing and Clacton CTAs where the Transition Altitude has been raised to 6,000 feet but the base is still defined as a Flight Level. In that case, the appropriate altimeter setting should be the corresponding Regional Pressure Setting (RPS), as suggested in the CAA’s Director of Airspace Policy’s Decision Letter on raising the Transition Altitude.

As always, when planning to fly beneath Controlled Airspace with its base specified as a Flight Level, pilots must ensure that they are not flying within it. **At any time when the setting on the aircraft altimeter is lower than the Standard Pressure Setting (SPS) of 1013.2 HPa, the true altitude of that Controlled Airspace base will be lower than the Flight Level indicated on the charts would suggest.**

RPM, temperatures and pressures, ASI reading??

The instructor in a PA28 was disconcerted when, while carrying out the usual checks during the take-off run, he realised the airspeed indicator needle was not moving. However, rather than instruct his student to abandon the take-off, he considered that it would be a lesser risk to continue. At about 700 feet the problem resolved itself when the cover fell off the blade pressure head.

The events leading up to the incident, while unique to this individual case, can strike a chord with most pilots. The student on the previous flight had fitted not only the control lock (the wind was quite strong) but also the pitot cover. The instructor had asked Air Traffic Control for permission to carry out circuit training, and had been advised that such training would only be possible for another 35 minutes, by which time the aircraft would have to be on the ground again.



While the instructor completed the paperwork, the current student was sent to the cockpit to strap in. After a cursory check of the exterior and a confirmation of the fuel and oil state, the instructor joined his student and started the engine, aiming to minimise unnecessary time on the ground and give the student as much value from the curtailed trip as possible. The normal light aircraft taxi pattern led to the mid-point of the runway.

Having received take-off clearance, the student taxied onto the runway and applied power gradually, so acceleration was slow. By the time the instructor realised the ASI was not indicating, the aeroplane was approaching rotate speed. Because the aerodrome was used by military fast jets, an arrester cable stretched across the runway ahead. For that reason, and believing that the student could safely gain value from an approach with no airspeed indicator to the long runway, the instructor decided to continue rather than abandon the take-off.

Instructors know the pressure of trying to give maximum value to students while constrained by factors outside their control. Other pilots can feel constrained in a similar manner. Often, such pressure is only perceived, and adopting a relaxed attitude can allow us to carry out the required actions in only fractionally more time than deliberately rushing. Indeed, as is often seen, 'the more haste the less speed' and rushing actually uses more time. The instructor in question is and was fully aware that a pre-flight external check has to include the whole surface, but allowed himself to fall victim to that perceived pressure.

Burning?

An incident report published with GASIL 11 of 2011 in December concerned 'a burning smell'. Another concerned smoke in the cockpit. Fortunately, neither seemed to have turned out to be very serious, but their publication should remind us of the possibility of a fire developing in the cockpit while airborne. Some Flight Manuals and Operating Handbooks provide guidance in the event of smoke or fumes in the cockpit, but others rely on general airmanship and basic training.

The reported incidences related to lighting rheostats, and light switches of various types seem to be relatively frequent causes of burning and associated smells. Usually the initial reaction to smoke or a burning smell would be to select all electrical services OFF, then select essential services back on again individually in order of importance. However, the position of rheostat controls for cockpit or instrument lights may not be obvious, and nor, in daylight, might the fact that the lights themselves were on. We must be familiar with all aspects of our aircraft.

Mandatory Permit Directives

The following Mandatory Permit Directive (MPD) has recently been issued by the CAA. Compliance is mandatory for applicable aircraft operating on a UK CAA Permit to Fly. MPDs can be found at www.caa.co.uk/mpds.

Although the CAA has decided to 'freeze' publication of CAP 661, all MPDs currently published in that document remain in force. In future, in order to assist users to identify MPDs, the CAA will add the 'Alphabetical Index' currently found in the front of the hardcopy of CAP 661 to the MPD webpage. This Index will be updated whenever a new MPD is added to the webpage and will assist users to identify the relevant directives by name/type.

Owners of aircraft with Permits to Fly and their Continued Airworthiness Managers should register to receive automatic e-mail notification when a new MPD is added to the website, through www.caa.co.uk > Publications > Subscriptions > New User Subscription Registration, and choose the 'Safety Critical Information' category. Once you have subscribed you will be notified by e-mail every time a new or revised MPD is published on the CAA website.

MPD 2012-001E	**Rotax 912, 914**	**Oil pump attachment bolts**

GA Safety Evenings 2012

GASCo, the GA Safety Council to which the CAA is a major contributor, is organising this winter's series of Safety Evenings. The evenings are of value to everyone involved in general aviation, whatever they fly, operate or maintain. Logbooks will be signed when requested as proof of attendance. The programme of currently confirmed events is shown below, to start at 1930 unless indicated.

For updated information, see the CAA website www.caa.co.uk/safetyevenings or the GASCo site at www.gasco.org.uk. Organisations wishing to host a future safety evening should contact GASCo on 01380 830584 or by e-mail to ce@gasco.org.uk.

Date	Area	Venue	Contact
13 Mar	Ilchester, Somerset	RNAS Yeovilton, BA22 8HT	07779 288864
14 Mar	White Waltham, Maidenhead	West London Aero Club, SL6 3NJ	01628 823272
15 Mar	RAF Halton, Aylesbury ***(at 1800)***	Nuffield Sports Pavilion, HP22 5PG	01296 656026
26 Mar	Carlisle Airport ***(at 1915)***	Terminal Building, CA6 4NW	01228 573490
27 Mar	Dundee Airport	Tayside Aviation, DD2 1UH	01382 644577
28 Mar	Dyce Flying Club, Aberdeen	Thistle Airport Hotel, AB21 0AF	dockate@gmail.com
29 Mar	Oban Airport ***(at 1900)***	Main Terminal, PA37 1SW	01631 710920
30 Mar	Cumbernauld Airport	The Café Area, G68 0HH	07743 424243
31 Mar	Ulster Flying Club, Belfast ***(at 1700)***	Newtownards	07709 000999
4 Apr	Redhill Aerodrome	Aero 14, RH1 5JY	01737 821801
8 Oct	Popham Airfield, Winchester	The Clubhouse, SO21 3BD	07831 606075
3 Nov	Old Sarum Airfield, Salisbury ***(at 1900)***	Old Sarum Flying School, SP4 6DZ	01722 322525