RETURN TO SERVICE POST COVID 19

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With the nation in lock-down, many LAA members will be wondering about their aircraft sitting unflown in their hangars, and what they will need to do to return them safely to flight after freedom of movement returns. This Technical Leaflet has been designed to provide practical advice on how to ensure your aircraft is in a safe and airworthy state when the COVID quarantine restrictions are relaxed.

Few of us have access to our machines during the lock-down period but for those who do, or whose aircraft are accessible to a maintenance outfit that's still working through this period, this Technical Leaflet also includes suggestions about actions that might be taken to minimise the problems later.

ENGINES

For engines, the first port of call should be the maintenance manual which will most likely include advice about measures to take during short-term periods of disuse, long term inhibiting programs and how to bring the engine back into service after being inhibited. The references at the end of this leaflet include links to the maintenance advice for the popular Continental and Lycoming engines, and also, for the latter, the very helpful 'Lycoming Flyer' which provide a wonderful compendium of advice for all aspects of looking after these engines.

Unfortunately, due to the suddenness of the lock-down, and all the other conflicting priorities during the lead-up period, most of us will not have had a chance to inhibit our aircraft's engines beforehand or carry out any preparation at all for a period of disuse. In this situation, the factor mostly affecting the engine is the environment in which it is stored – high humidity levels, particularly when coupled with environmental salts, can be a real problem for almost all metals.

However, in reality, under any normal storage conditions, most engines will be OK for two to three months of not being run in the UK, especially in the spring and summer months. After all, despite the best of intentions, many of us don't get to fly over three or four months during the worst of winter, yet we take few special measures to tend to the engine either during this time or on its return to service.

Please Don't Just Ground Run

During such a period of inactivity, the worst thing you could do would be to give the engine a short ground run. This is unlikely to get the oil hot enough to drive off moisture, encouraging water to pool in pockets within the crankcase and other expensive components, which can exacerbate internal corrosion.

Fortunately, internal corrosion will be minimal in most engines, particularly if they either use an oil with a corrosion preventative additive or the engine has been in service for long enough for the oil to form a protective internal varnish-like layer coating all surfaces.

There will always be some condensation inside the engine from water in the blow-by gas, as well as from atmosphere via the breather, but getting the engine properly hot means the water suspended in the oil or sitting in the bottom of the sump will boil off. Realistically, the practical way to get the engine's core temperature that hot is to fly it – and probably, for at least half an hour – as already stated, a short ground will likely do more harm than good.

If you have an engine mounted in a 'pusher' configuration, please also remember that without the benefit of prop-wash, your engine might reach critical cylinder head temperatures on a ground run before the oil has fully warmed up.

Oils
If you are using an engine oil which includes a corrosion inhibitor, corrosion problems will be minimal unless the engine is left for a significant time. If on a 'straight' oil then consider adding some corrosion preventative liquid to the oil tank such as Aero Engine Guard, using an amount as specified on the tin, then with spark plugs out, turn the engine until you get oil pressure indicating on the gauge, finally add a small amount of the corrosion preventative agent (a teaspoonful, say) in each cylinder through the top plug hole, and put the plugs back.

You need to be careful when choosing a corrosion preventative agent. Some are anti-corrosion products that produce a vapour (like the coated paper we used to put in tool boxes), which when coated on surfaces in the correct quantities has no special lubrication effects. Others such as 'Camguard' contain special lubricants which means that if it is used in an engine that's during the run-in period on a straight oil, it will never successfully run-in because of the effect of the extra lubrication. These products are fine in a well-used engine particularly if it has run all its life on straight oil, in which case it is likely be nicely coated in a protective black tar inside – except of course, on the bearing surfaces.

Lycoming Camshafts
After being left unused for many months, Lycoming engines can have cam problems, especially if using straight oils without any corrosion inhibitor. The configuration of these engines means that the cams are only splash-fed and over a long period of being static, the oil film between the cams and cam followers can break down. This leads to spalling of the hardened surfaces and rapid cam and follower wear over the next few tens of hours running.

To prevent this, products such as Camguard can be used on a run-in Lycoming that's using an oil which doesn't already contain a special cam and follower-protecting additive. However, if using Aeroshell 'W+' or similar oils which contain a cam additive then there's little benefit, if any, in adding further additives. If the engine is running-in using a straight oil, further additives may prevent the engine ever running-in successfully because of the unwanted extra lubrication.

The 4 cylinder Rotax and Continental engines, with their underslung camshaft arrangements don't seem to suffer the same cam problems, especially if running on multigrade oils with good anti-corrosion additives.

Volkswagen Valves
VW engines, despite their Continental-like configuration and low-set camshafts can suffer in the same way as Lycomings after a long period of disuse, although in practice this is not so serious because camshafts and cam followers for VWs are comparatively so cheap that if they do need to be changed at a later date then the bill will only make a comparatively minor dent in the family budget.

VWs do however sometimes suffer from valve seat and valve stem corrosion after being left for a few months, which can lead to sticking valves and no compression - meaning the engine cannot start, rough running - or worse, the valve head separating from its stem, leading to wholesale destruction of the piston crown and cylinder head. To counter this, spraying WD40 up short exhaust stacks and into plug holes seems to help.

It's so quick and easy to whip the heads off a VW and do a top overhaul that your inspector might well suggest doing this anyway, so that you can check the valve stems and guide wear and while you're at it, clear out the port passages and grind in the valves. Just be sure to torque up the nuts on the head studs carefully afterwards, using the correct sequence and not to over-torque them – using the bespoke manual for your particular aero-conversion (Aerovee for example) or, if it's a Peacock or similar home-conversion, see the Haynes automotive manual.

Gipsy Majors
The venerable de Havilland engines suffer from a special form of corrosion problem as moisture is deposited inside the crankshaft, which is in effect part of the oil filter system, and corrodes the crankshaft from the inside. This creates corrosion pits that act as stress concentrations and trigger fatigue cracking. The hollow big ends on Gipsy type engines act as centrifugal filters, and once water gets in there is no way for it to escape unless it is boiled off by running in flight.

On Gipsy engines, as well as introducing the corrosion preventative into the cylinders you can remove the cap of the oil suction filter and pour some corrosion preventative into the oil filter so it goes direct to engine.

To Turn or Not To Turn?
Aircraft owners often ponder over the advisability of regularly turning by hand the propeller of an aircraft that's static, perhaps on a weekly basis. Followers of this mantra suggest that this will help keep oil spread over the length of the bores, cam and bearings, and perhaps avoid corrosion rings developing in the bores where moisture might gather over the top piston rings. By avoiding just one or two inlet and exhaust valves being open for the whole time the aircraft is out of use, corrosion of the valves and seats on those valves might be avoided, and the chance of any corrosion developing on the valve stems might also be reduced.

Unfortunately, there's a counter-argument that turning the prop like this might tend to wipe off the oil film on the surfaces of the parts, promoting corrosion. We suspect that there's no simple answer, and this is a good reason to refer to the engine's manual for advice.

It certainly depends on the particular material properties of the parts concerned, the type of oil used, the amount of use the engine has seen with this and previously-used types of oil, and the aeroplane's storage conditions, to name just a few variables.

To turn the motor by hand when it's known to be already well-lubricated is unlikely to do harm, whereas turning over a motor that's already been sitting 'dry' for months might do more harm than good – best check with a boroscope down the plug holes to check for bore corrosion before turning that prop, particularly if the engine is running-in and therefore using a straight oil which offers no corrosion protection.

Another factor to be taken into account is the risk involved in turning a prop, which after all we are trained to treat as 'always live'. In a crowded hangar, it's not unknown for a propeller that bounces through compression to clout and dent the wing or tail of an adjacent aircraft.

The risks to life and limb, not to mention aircraft and property, of an engine starting inadvertently in a hanger full of aircraft doesn't bear thinking about. The magneto switches of many aircraft are not that reliable at the best of times, and might be even less so after a period of disuse allows an oxide layer to build on the contact faces of the switches.

Never forgot that there's a risk that even a long-unused engine might burst into life when the propeller is turned, particularly if the magnetos have impulses. Remember that when an impulse unit is fitted, the magneto's spark will be just as fat whether you turn the propeller with the pressure of one finger or a lusty swing putting your whole effort into it – and if the charge in the cylinder happens to be somewhere near the right mixture strength, she might fire.

This is a particular concern if, as with many simpler engines, the standard operating procedure is to stop the engine using the mag switches rather than putting the mixture to idle cut-off. With an engine equipped with impulse magnetos, if you ever have to turn the propeller by hand

for reasons other than as part of the starting procedure, after checking the mag switches are off, turn the propeller backwards as this will avoid the impulse units coming into play.

However, if your engine is fitted with a vacuum pump, you should NOT turn it backwards. The vanes within the pump sit at an angle that can cause them to 'catch' on the ports and fracture. Likewise, Continental engines fitted with a 'sprag' clutch on the starter and Rotax 91x series engines should also not be turned backwards.

Electronic ignition units also have the potential to create full-size sparks even when turning the prop slowly, so similar care is needed to check that they are not powered up.

Bearing in mind the above, our advice is that when introducing corrosion-preventative to the engine you don't turn the engine over unless can spin it over with the spark plugs out and get full oil pressure for a minute or so. If using an electric starter to do this, make sure the starter and battery do not overheat.

Providing you have done this, or if the oil has been changed within the last 20 flying hours and is an oil with a corrosion preventative in it, then turning the engine 1/4 turn ONLY every 6-8 weeks to reposition the pistons and valves will be fine – or if the manual advises it, just leave it alone. Turning the engine more often, or more extensively risks wiping oil off the cams and other moving parts, and can lead to worse corrosion problems.

The worst thing to do with a typical four-cylinder four stroke engine would be to turn the prop though exactly two revolutions which will leave the valves and pistons in just the same places as they were beforehand. For a geared engine, or a radial, turn it through one compression only. With a radial, consider removing the bottom plugs first to let out any surplus oil, to avoid any risk of hydraulicing.

If in the weeks to come it looks like we will be locked down for a much longer period then you could consider other corrosion preventative measures and short-term inhibiting like for example putting plastic bags over exhaust outlet(s) - or you can use tennis balls with suitable holes in one side, rather like the schoolboy potato trick for booby-trapping 'Sir's' Austin Cambridge.

Better still, before blocking the exhaust, stuff some pieces of rag soaked in vapour oil or spray WD40 up it before stuffing in rag. You can repeat the process of removing the spark plugs from time to time and introducing more WD40 or vapour oil then re-fitting plugs, if you wish.

Whatever you do though, be sure to leave a reminder in the cockpit, as well as in the logbook, so that the next person who comes to try to start the engine knows what's been done to it – whether the sparks plugs are only finger tight for example - need we say more ?

Fuel

When it comes to re-commissioning the aircraft after the lock-down, one aspect that will need to be considered carefully is the contents of the fuel tanks. Have the tanks got water in them because of condensation, or from the aircraft standing outside in the rain?

Mogas is notorious for going stale, being supplied in the expectation that in a road vehicle it will be consumed within a few weeks of purchase. Stale mogas may have evaporated away some of its octane-enhancing additives, leading to an increased likelihood of ruinous detonation. That is, if it allows the engine to start at all, for stale fuel also has reduced volatility and very often causes problems at start-up.

Plus of course, it's well known that Mogas is supplied with seasonal changes of volatility to match the properties to the changing ambient temperatures, so fuel bought in autumn of 2019

might be ill suited to use in the summer of 2020. Its higher vapour pressure may make it more prone to vapour lock.

Most worryingly, in some ways, the chemicals created as Mogas goes stale have sometimes appeared to attack non-metallic fuel tanks, fuel pipes etc even though these have been resilient to fresh fuel.

With Mogas, the answer is clear, (and indeed, embedded in the requirements for Mogas fuel) – any Mogas that's more than a few months old should be drained out and replaced.

Even 100LL Avgas has a limited life even though it is a much more stable and uniform product – 100LL fuel that's over six months old should be treated with suspicion. Whatever the fuel type, after a long time out of use we should pay special attention to water drain checks – from ALL the drain points - particularly if the aeroplane has been parked out in the rain for any length of time. Be sure the aircraft is on level ground when you do the drain checks, otherwise all the water in the system may not be extracted.

While fuel sitting in a tank for a long time can cause a problem, there can also be trouble with fuel systems that have been empty of fuel – for example if you drained the system before the lock-down you might find that when re-filled, leaks appeared due to the seals in fuel cocks and suchlike having dried out and shrunk. You can guard against this using a proprietary 'fuel lube'.

Turning the dried-out fuel tap on and off in the hope that it will improve matters will risk tearing the contact surfaces of the seals and doing permanent harm. Whilst you're about it, check all fuel filters - there's a mould-like form of wildlife that's sometimes found growing on fuel filter elements, apparently thriving off the heady combination of water condensate, petrol and petrol vapour found within. The build-up of this almost invisible microscopic mould can very effectively stop the fuel flow – to guard against this we'd suggest that any disposable type fuel filters are replaced as a matter of course.

AIRFRAMES

Turning to other aspects of the aircraft, whereas we are used to reminding ourselves annually about things to look out for after a winter break in flying, what might be the implications of our aircraft being static through part of, if not all of the summer? Just as wooden boats dry out and their seams leak if they are out of the water for any period, a wooden aircraft will tend to dry out if kept in a warm hangar month after month without seeing even a passing rain shower.

If the aircraft has a closed-loop stranded steel cable system operating the control surfaces (most likely, the ailerons) then you may find that the cables have gone slack, because of the wooden structure shrinking as it dries out. You'll need to adjust the cable tensions to within the proper range before flying again (count the number of half-turns on the turnbuckles needed to take up the slack, and make a note of the number in the logbook), particularly as control surface flutter might be the result of not doing so. Just be sure to be ready to slacken the cables off again once the aircraft has returned to normal moisture content later, or you might suffer a 'sudden twang' next winter!

Drying out of wooden airframes can have other even more serious consequences, including causing shrinkage cracks in the wooden structure.

Wood shrinks by differing amounts parallel and perpendicular to the annual growth rings as it dries out, so that members of rectangular cross section may end up parallelogram-shaped – if the member is built into a wooden box spar or creates the intersection of ply fuselage sides and

floor then this can create huge internal stresses and, like a wooden boat, the structure can literally start to split open at the seams. Watch out for signs of cracking in the root ends of wooden wing spars, particularly in the vicinity of the through-bolts attaching the root end fittings.

To prevent this kind of nightmare scenario, where you can, allow free ventilation in hangars and if possible, give the aircraft a thorough wash-down from time to time, sluicing it well with water in the process. Thankfully, these sorts of problems are only likely to occur in the most extreme cases, such as if your aircraft lives in a totally enclosed, dark-painted hangar exposed to full sunlight, or, with wings folded, in a sealed container.

Part of the preparation for flight should include giving it a good clean, which will not only remove possibly corrosive dirt and dust from the surfaces, it will give a good opportunity to inspect every square inch of its surface at the same time. Be careful not to scratch the surfaces when you clean them – especially the Perspex windscreens and canopies. The aircraft's maintenance manual may give advice on suitable cleaning products, which may be very different on a composite aircraft than a metal one, for example.

Whatever the type of airframe, be very careful before using anything aggressive on its surfaces, when trying to remove mildew for example - it's generally better to dissolve and float away dirt with lots of water than to try to scrub it away with a rag.

With an aluminium airframe, if spots of corrosion are found to have developed, it's often tempting to try to rub them away with wet and dry paper, to smooth the surface, and then paint over the top hoping this will prevent the corrosion re-occurring. This will almost never be successful, and by removing any surrounding cladding, can do more harm than good.

The proper procedure is to treat superficially corroded areas with a 10 percent solution of chromic acid and sulfuric acid, applying the solution with a brush. Scrub the corroded area with the brush while it is still damp. While chromic acid is a good inhibitor for aluminium alloys, even when corrosion products have not been completely removed, it is important that the solution penetrates to the bottom of all pits and underneath any corrosion that may be present. Thorough brushing with a stiff brush should loosen or remove most existing corrosion, or ideally, use a bead blaster to assure complete penetration of the inhibitor into crevices and pits. Allow the chromic acid to remain in place for at least 5 minutes, and then remove the excess by flushing with water or wiping with a wet cloth. There are several commercial chemical surface treatment compounds, similar to the type described above, which may be used in a similar fashion.

Wildlife

Another implication of an aircraft having been left undisturbed for a considerable period of time, particularly in the spring, is the strong possibility of wildlife having taking residence inside it. Watch out carefully for the tell-tale signs of nest-building by birds or rodents, in the form of strands of grass and twigs feathers, etc, left behind en-route, the inevitable white splashes/droppings and, in the case of rodents, the all-to-obvious smell. Hence the need to remove all cowlings and access panels to check the airframe's internals for unwanted guests.

Rodent urine is well known for its ability to corrode aluminium airframes, but if inside a fabric covered wing, rodents seem to particularly enjoy chewing through the tracery of rib stitching thread which can leave the whole fabric cover in danger of tearing off in flight. A composite airframe might be less vulnerable but one can imagine that the expanded polystyrene foam cores of some composite flying surfaces might make ideal nesting material…. You can find advice on dealing with rodent infestation in the FAA's repair manual AC43.13, which is available online (see references).

Creatures of a smaller size can also cause problems with blocking vents in fuel tanks and pitot and static ports, which will also need carefully checking. You don't want to find that your first flight after a long lay-up is enlivened by a grossly under-reading ASI, a haywire altimeter or worst of all, an engine failure due to fuel starvation.

Cables and Wires
Other parts of the aircraft worthy of TLC are the control cables to the flying controls and wire bracing of biplanes and other externally braced types. Control cables can be treated with lanolin – put some on a piece of rag and slide it up and down the exposed lengths of cable, which will also quickly reveal any broken strands by snagging in the cloth (watch your hands).

Stainless steel streamlined bracing wires are best washed with soapy water and then rinsed with fresh water to remove the inevitable grit and the corrosive remains of insects. Lubricate control surface hinges, door hinges, etc, as indicated in the aircraft's manual and check that control surface travels are all 'full and free'.

Propellers
Propellers are another area worthy of special attention. If it's a simple wooden propeller, the wooden hub may have shrunk in the dry weather, allowing the propeller bolts to become loose, so we'd recommend removing the spinner and checking the bolts are torqued per the prop manual.

Make good any blemishes in the surface finish, especially if they have exposed the underlying wood – typically along the leading or trailing edges where the paint finish may wear or crack, with a risk that this will allow water to penetrate under the finish and undermine its adhesion over a wide area, which could quickly lead to the prop's demise.

If it's a variable pitch or constant speed propeller, hopefully it'll have been left covered up and, if it's a two-blade example, it's been parked with the prop horizontal so that rain does not get into root bearings and pitch change mechanism. Watch out for signs of corrosion on the blades leading to bubbling of the paint, which might quickly lead to disastrous blade failure if left un-treated – if this is found, best call your prop-shop for advice as it probably means that the prop needs a bare-blade inspection and overhaul before returning it to service.

Undercarriage
With the exception of our very few seaplanes (which pose problems of their own too specialised to discuss here), all LAA aircraft have wheels, and sitting without moving may have caused problems in this area. Particularly if not inflated to a high pressure, tyres may have developed a 'flat spot' if they're not turned for ages, which will create a troubling vibration when you come to take off. If possible, jack each wheel in turn off the ground and check it for flat spots by giving it a spin – that way you'll also get a feel for the condition of the bearings.

While you're at it you can check that the brakes aren't stuck or dragging, and look out for tell-tale drips, puddles on the floor or other signs of brake fluid leakage. If you find a flat spot, inflate the tyre to near its rated pressure and leave it for a while (preferably, if safe to do so, with the aircraft's weight still off it) to recover its original shape. Remember to let the pressure down to the maximum pressure allowed for use in the aircraft before flight, however, or your first flight after the lock-down may be marred by a much bouncier landing than you deserve!

Electrics
For aircraft so blessed, the electrics will also warrant attention. A conventional lead-acid battery will probably respond best to trickle-charging when you want to bring it back to life, but for any other of the more energy-dense alternatives, check the instructions for advice on the best

procedure to recover them from a largely drained condition. Some are easily destroyed by being allowed to discharge below a certain voltage, others respond better to deep cycling than a continuous trickle.

If the starter motor won't turn when you energise it, suspect a poor connection to the battery, or a poor earth – if the motor's earth is suspect, be sure not to accidently end up passing the starter motor earth current by default through lesser instrumentation wiring, which will certainly cause the small-diameter wiring to burn out, or via the throttle cable or other random route.

Paperwork Package
Be sure to check that as well as the aeroplane being in a sound condition, your paperwork bundle is all in order, making sure that your Permit to Fly is valid, logbooks are up to date, your PPL is current, etc. If you've adjusted control cables, have you had duplicate inspections done after locking them up? If you've done pilot maintenance, have you made out your logbook entries? That 'do not fly' notice you put in the cockpit months ago – what was that about? If you put the aircraft's insurance on 'ground risks only' during the lock-down, have you remembered to reactivate it to include flight risks?

Aircraft maintenance flights
The Government's guidance permits essential maintenance activity to take place during the current COVID-19 restrictions, and on this basis owners/operators of GA aircraft are permitted to conduct aircraft maintenance flights on the following basis:

- Maintenance flights. Post-maintenance check flights in accordance with CAP1038 are permitted but must be kept to an absolute minimum in terms of both the number and duration of flights. They must be conducted in strict accordance with the approved maintenance or flight test profile.
- Ferry flights. Flights to or from maintenance facilities for essential maintenance are permitted if such a facility is not available at the aircraft's current location. Flights are to be by the most direct practical route with transits flown at no lower than 1,000 feet Above Ground Level (AGL).
- Engine health flights. The main way of maintaining engine health during COVID restrictions should be through winterisation or inhibition. Engine health flights are only permitted, where required by the engine manufacturer or equivalent LAA/BMAA procedures for Permit-to-Fly aircraft.

Flights must follow those procedures and there must be a four-week gap between flights. Each flight must be no more than 30 minutes (or as recommended by the engine manufacturer in order to prevent internal engine corrosion). Aircraft should aim to remain within the airfield circuit. Unless safety of flight requirements dictate, the aircraft should not travel beyond a 10nm radius of its departure aerodrome and no dynamic manoeuvring activity should be flown.

Each flight should be at the highest practical height to minimise to the noise impact on members of the public maintaining social distancing, and not below 1,000ft AGL except for take-off, approach and landing. If the engine manufacturer's instructions indicate that the engine only needs to be run at idle or at low power whilst on the ground and no other essential maintenance is required, then no flight may be performed.

Criteria for the conduct of these flights:
While the UK Government's social distancing policy is in place the owner or organisation operating the aircraft must maintain a log of all the aircraft movements. As a minimum, this must include the purpose of the flight, the aircraft registration, the pilot and their licence number, the flight's date, time and duration. This log is to be kept and if required provided immediately in electronic form to the CAA.

- Only solo flights by fully qualified pilots are permitted. No other flights, including instructional sorties are allowed. Aircraft must not be rented-out or flown for financial gain.
- Aircraft must have a valid airworthiness certificate (CofA, Permit or Permit Flight Release Certificate) before a maintenance, ferry or engine health flight can take place.
- These provisions apply equally to UK-registered and non-UK registered GA aircraft operating in UK airspace.
- Any requests for exceptions to these provisions are to be submitted to ga.ga@caa.gov.uk a minimum of 10 days in advance of the requested date of the flight.
- At all times, the measures outlined by the UK Government to reduce the risk of the spread of COVID-19, such as social distancing, personal hygiene and minimising travel remain applicable, and pilots and operators undertaking flights on the basis permitted here must observe these. Aerodrome operators must also ensure that such flights are coordinated so that social distancing measures are not compromised at their location.

Don't Worry, but Stay Safe
If all the above sounds alarming, then it really needn't - after all, hundreds of aeroplanes get to be left to their own devices each summer anyway for one reason or another, perhaps because they are in the process of changing ownership, or because they are grounded due to some snag needing to be fixed, the owner has lost interest or has too many other toys to play with.

Generally, these aircraft are brought back to life with the minimum of problems after a quick wash and wipe and an appropriate inspection. This year, with all of the LAA fleet in the same predicament it's worth paying particular attention to this aspect with advice about the appropriate special inspections and a recommended approach to this year's unique scenario.

When the lock-down ends and we can get out and about again, we will all have been traumatised to a greater or lesser extent by the global tragedy unfolding. Keen as we might be to get back in the air again, once other family commitments are seen to we should book a couple of days of solid 'quality time' with our aircraft to attend to their needs, as described above, and to get our heads back into the world of flying and all that goes with it.

Let's invite our nearest and dearest to visit those distant relatives for the weekend (after months in isolation with you, he or she will probably jump at the chance), then head to the airfield and get our craft out in the sunlight again, strip off all the cowlings, fairings and access panels and give it a really good once over.

Even if it isn't out of Permit, your inspector will be happy to help – 'two pairs of eyes are better than one', and your inspector will I'm sure be equally keen to get back into the world of sports aviation.

After the long gap, we'll be rusty about our flying, too. Talking flying with fellow enthusiasts, and spending a couple of days communing with your aeroplane will help get you back into thinking of the difference between QFE and QNH, different classes of airspace and whether to add or subtract the compass variation, the relationship between stall speed and bank angle and suchlike. Nevertheless, we'll do well to limit our flying to simple sorties initially, and avoid tricky crosswinds and difficult navigation until we're fully back in the groove.

Remember, there's a cadre of LAA coaches ready and waiting to help you as well as the LAA inspector team!

REFERENCES AND LINKS

Lycoming:
https://www.lycoming.com/sites/default/files/Engine%20Preservation%20for%20Active%20and%20Stored%20Aircraft.pdf?_cldee=YWp6Yml6QGhvdG1haWwuY28udWs%3d&recipientid=contact-83c0cfd92058e81180cb00155d001743-5920e2df051c40bfbf60df519719ae62&esid=ef162f62-9f75-ea11-80cd-00155d001743

Lycoming Flyer:
http://www.alfako.be/SAFETY%20DOCS/lycoming---flyer_key_reprints.pdf

Continental:
http://www.reiffpreheat.com/Continental%20SIL99-1.pdf?_cldee=YWp6Yml6QGhvdG1haWwuY28udWs%3d&recipientid=contact-83c0cfd92058e81180cb00155d001743-5920e2df051c40bfbf60df519719ae62&esid=ef162f62-9f75-ea11-80cd-00155d001743

AC43.13:
https://www.faa.gov/documentlibrary/media/advisory_circular/ac_43.13-1b_w-chg1.pdf

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