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## Cold Start Checklist

It's that time of year again when cold starting becomes an issue. The following list has been prepared to help operators minimise their starting issues in cold weather.

1. **Starter motor condition.** Check that the bushes in the starter motor bendix drive housing are in good condition. Ensure the brushes are not worn out, that the commutator is clean and all electrical connections are clean.
2. **Spark plugs.** Spark plugs must be within the set life and be gapped correctly. In winter spark plug gaps can be reduced as low as 0.21" to allow the plugs to fire more easily.
3. **High tension leads.** High tension leads must be in good condition. Ensure all end terminals are tight and fitting to the distributor & spark plugs correctly. If necessary use a screwdriver to adjust the metal terminals inside the plugs of the leads to give a tight fit onto the spark plug and into the distributor cap. Don't forget to check the plug where the ignition coils connect to the distributor cap.
4. **Distributor assembly.** Check that the distributor & rotor are in good condition. Check that there is no moisture inside the cap and that all the electrical terminals are clean.
5. **Ignition coil gaps.** Check that the coils have been set with the correct air gap from the flywheel magnets.
6. **Air filter.** Check that the air filter is clean.
7. **Fuel filter.** Check that the fuel filter is clean.
8. **Carburettor.** Check that the carburettor float level is set correctly and that the carburettor is clean and in good condition. Ensure there is no debris blocking jets (including the choke jet) etc.
9. **Operation.** Minimise the time spent at low RPM with high-powered devices running. At low RPM the alternator produce virtually no power – certainly not enough to run landing lights, strobe lights and avionics suites. The deficit between the power draw of these systems and the alternator output must be drawn from the battery. Excessive operation like this will drain the battery and significantly reduce the output available for cold starting the next day.
10. **Fly regularly.** Any vehicle will be harder to start if it goes a long time between outings. If the aircraft has not been flown for a few weeks then charging the battery before attempting a start is recommended. Standing also affects the quality of the fuel in the carburettor and fuel system – volatile elements in the fuel can evaporate, making it harder for the carburettor to atomise it properly.
11. **Battery condition.** The life of a Battery varies but is generally less than 4 years.
12. **Starting method.** The recommended procedure is to hold the choke fully ON and the throttle fully OFF. The Bing carburettor uses an enrichment-type choke system (as opposed

to a butterfly-type choke) which will only work properly if the throttle is fully closed. When the throttle butterfly is closed it creates a vacuum which is then used to suck fuel through the choke jet – if the throttle is not closed there is less vacuum and the choke does not work as designed. Also note that there is a tendency for the choke to spring back slightly from the ON position if the knob is released – operators are recommended to hold the knob fully ON when starting to make sure it stays properly on.

13. **Idle speed.** Ensure that the idle RPM is set correctly. If the idle is too high the throttle butterfly will be open slightly – which will prevent the choke from working properly, as described above. Idle RPM limits are given in the engine manuals.
14. **Choke Jet.** The choke jet needs to have a bore of about 1.2mm. This gives the engine more fuel when the choke is applied, making it easier to start. New engines and aircraft have been set at this size since around February 2011, however older units will need to be checked and, if necessary, enlarged. See Figure 1.

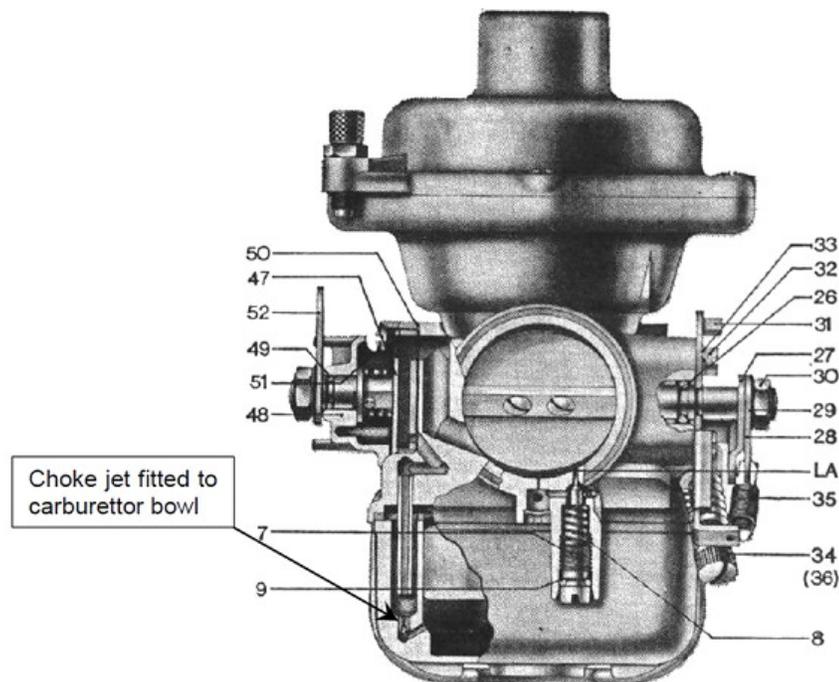


Figure 1 – Choke Schematic