

Teaching how to deal with Birdstrikes

- a guide for flight instructors



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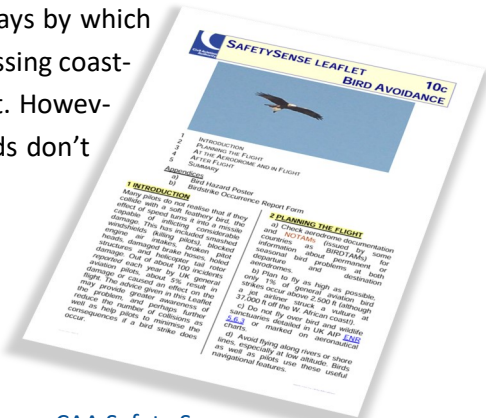
TEACHING ABOUT BIRDSTRIKES & CONTROLLABILITY CHECKS

Unfortunately bird strikes are not uncommon in the UK, and every time we go flying we run the risk of coming into violent contact with a bird. There are a number of ways by which we can mitigate the chances such as avoiding known bird breeding areas, crossing coast-lines or large bodies of water at or above 1000', and keeping a good lookout. However, none of these is any guarantee of immunity, nor is it true to assume birds don't fly at night (ask any owl).



Evidence of bird impact through the propeller arc

Another assumption that it would be unwise to make is that birds cannot get through a propellor. Also, just because we don't have a huge hole sucking in air like a jet does, a determined bird can, and has, got by the prop, gone into the air intake and ended up in the engine compartment.



CAA Safety Sense



Evidence of penetration of the engine compartment



The moment a bird breaks through the windshield

A birdstrike, especially if it hits the windshield, can be a frightening and disorientating experience. Apart from the initial shock there may also be the problem of much reduced visibility through the windshield itself, irrespective of any damage to it. If the windshield is holed then there will be the additional problems of noise which may make RT communications difficult if not impossible, plus the effect of the airflow coming into the cabin.

There is lots of advice available on the internet about how to reduce the risk of birdstrike, but very little about what to do if a birdstrike occurs, despite the pilot's best efforts to avoid it.

What follows is not intended to be an absolute guide as to what to do in the event of a bird strike: there are far too many variables ranging from where and at what altitude it happened, where the bird hit (if known), weather, nearby controlled airspace, any engine or airframe damage and pilot ability/experience.

It is intended to be a guide, food for thought and a suggestion as to what might be a sensible course of actions were it to happen and something instructors could discuss with their students.



Typical windshield damage

3. Are there any obvious signs of airframe damage?



Damaged prop leading to fuselage impact



Damage to extended undercarriage, possibly severing hydraulic lines



Bird carcass embedded in otherwise intact windshield



Holed helicopter windshield



If there are signs of damage, a suggested course of action would be as follows:-

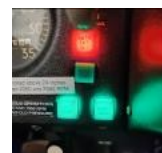
1. Subject to the base of cloud and Controlled Airspace, climb (not necessarily using full power) to at least 3000'.



2. Once level, power can now be reduced (slowly) to idle and the aircraft allowed to slow down. However, be prepared for any engine problems while the power is reducing.



3. For those aircraft with retractable gear, as soon as the speed has reduced to just below the gear down limiting speed, select the gear down and make sure you have safe gear down indications.

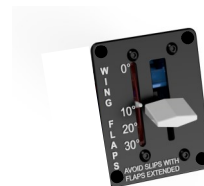


Note: It is perhaps not a good idea to raise the gear again once it is down so in order to avoid a lengthy transit with the gear down it may be worth waiting till close to the chosen landing airfield before doing this and the rest of the handling check.

4. Slow the aircraft to the flapless threshold speed making gentle turns in each direction up to 30 degrees of bank.



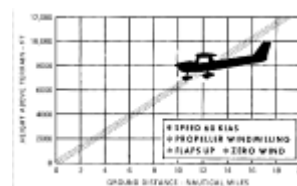
5. If handling is satisfactory then select flaps in stages. Keep your hand on the flap switch/lever and be prepared to raise the flaps to the previous setting if there are any signs of control problems. Also fly some gentle turns. Slow the aircraft to the appropriate threshold speed for the configuration you can safely get.



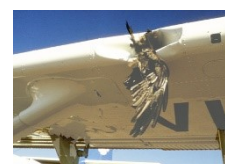
6. If all is well then descend and join the circuit. However, keep an eye on the speed so as not to exceed the flap and/or gear down limiting speed.



7. If there is any doubt about the integrity of the engine, then consider doing a glide approach but bear in mind that you already have gear and flaps down.



8. One other thing to consider as well is that if there is damage to the leading edge of the wing in the area of the fuel tank(s) then monitor the gauges carefully to see if there is a leak. Flying a turn may enable you to see fuel vapour behind the aircraft.



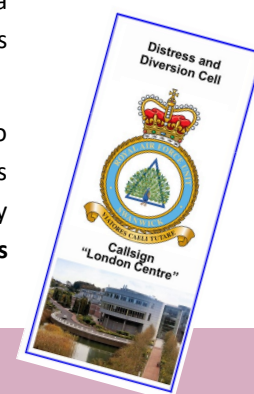
There are no obvious signs of engine or airframe damage



9. Just because no damage is visible does not guarantee that there is none, so all the considerations above should be borne in mind and a controllability check carried out. However, if there is no obvious sign of damage, then it may be that the bird impacted on one of the undercarriage legs and damaged a brake pipe. It may therefore be worth applying the toe brakes to see if there is even brake pressure on both sides. If you have a brake failure on one side then land on the side of the runway that has the inoperative brake.



10. Finally, tell somebody about it as soon as you are in a position to do so. Obviously, exactly when to do it will depend on the circumstances and what are considered to be the priorities, but sooner is probably better than later. **Don't hesitate to use 121.5 if your situation is concerning you.**



IMPORTANT NOTE:

All Birdstrikes, with or without damage, must be reported via the [Mandatory Occurrence Reporting \(MOR\) system](#). Suspected birdstrikes or encounters with flocks should also be reported.

The report should include the bird species, if identified, and the location of damage on the aircraft.

Overleaf is a suggested lesson plan that instructors could use for teaching what to do in the event of a bird strike. It is not necessary to go through the entire sequence and, as a means of introducing some variety for the student, any one or more of the scenarios could be used.

BIRDSTRIKES & CONTROLLABILITY CHECKS

AIR EXERCISE

AIM: The aim of this exercise is to teach the student the considerations in the event of suffering a bird strike and a sensible course of actions to follow.

Note: Unless there are obvious signs of engine damage, or the engine is at a low power setting do not immediately move the throttle.

SEQUENCE

OBSERVATIONS

WHAT DAMAGE IS VISIBLE?

1. Injuries to crew/passenger(s)
2. Engine damage
3. Airframe damage
4. None of the above

1. INJURIES?

Yes

- a. Transmit distress call.
- b. Land as soon as possible at an airfield where medical assistance is available.
- c. Unless considered necessary refrain from using full power for the transit.
- d. Be aware of possible handling problems when speed is reduced.

No

Check for engine damage.
Flying Instructors'

2. ENGINE DAMAGE ?

Working Group

Yes

Is engine providing enough power to maintain S&L flight?

No, not enough

- a. Transmit distress call
- b. Use what power is available to position for a forced landing or carry out an immediate forced landing.
- c. Shut the engine down in accordance with the Flight Reference Cards/ Checklist

Yes

- a. Transmit distress call
- b. Start heading towards a suitable airfield for landing.
- c. Carry out a controllability check.

No

- a. Transmit distress call
- b. Start heading towards a suitable airfield for landing.
- c. Carry out a controllability check.

....continued....

SEQUENCE

OBSERVATIONS

3. AIRFRAME DAMAGE?

Yes – obvious signs

- a. Transmit distress call
- b. Start heading towards a suitable airfield for landing.
- c. Carry out a controllability check.

Note: If damage is seen on the wings monitor the fuel gauges in case a fuel tank has been damaged/punctured.

Controllability Check

Note: Once the gear and flaps have been selected it is best to leave them down. In this case wait until close to the landing airfield before carrying out the controllability check.

- a. Subject to the base of controlled airspace and cloud, use power (not necessarily full power) to climb to at least 3000'agl.
- b. Reduce power slowly.
- c. Reduce speed to below gear limiting speed or flap limiting speed if fixed gear.
- d. Lower gear if applicable.
- e. Slowly reduce speed to the published flapless V_{ref} and roll gently to 30° bank each way.
- f. If control satisfactory select flaps down in stages.

Note: Keep hand/fingers on flap selector and if there are any signs of loss of control reduce the flap setting to the previous one.

- g. Reduce speed to the published V_{ref} for the configuration that is attainable and roll gently to 20° to 30° bank each way.

Is the aircraft controllable down to V_{ref} ?

Yes

Join the circuit and land using published approach and landing speeds.

No

Join the circuit and land keeping the speed at least 5 knots above that at which control became difficult. Consider doing a straight in approach.

No obvious signs of airframe damage

- a. Transmit distress call
- b. Start heading towards a suitable airfield for landing.
- c. Carry out a controllability check.

4. OTHER CONSIDERATIONS

- i. **Has a brake pipe been hit/broken?**
 - a. Apply both toe brakes to ensure equal pressure.
 - b. If brake damage confirmed or suspected then land on the same side of the runway as the failed brake.
- ii. **Is the forward view impaired by bird remains or damage?**
 - a. Consider side slipping on the final approach.
 - b. Give control to the other front seat occupant (if suitably qualified).
- iii. **If the windshield has been holed, can incoming radio transmissions be heard?**

Make "blind" transmissions.

EYE PROTECTION



Instructors and pilots who operate at low levels and by avian habitats are at higher risk from birds impacting the windshield than most.

Wearing safety spectacles, even if you don't need a prescription, may prevent an unfortunate incident becoming significantly more dangerous if the only pilot, or both pilots, suffer facial injury.

In the most hazardous avian environments, a flying helmet with visor is recommended.



Courtesy of Chelsea Myslik