

Exercise 9 Take-Off and Landing

Aim: To teach the correct techniques of take off and landing into wind.

Airmanship:

- **LOOKOUT – Good lookout all around**
- **Wind direction and velocity**
- **Surface type**
- **Ts & Ps**
- **Awareness of Downwash**

This should only be attempted once you have learnt to establish a stable hover. There is not much theory to this exercise but in practice it is not that easy. The trick is patience. Don't Rush. You need to feel how the aircraft is behaving and excessive control movement could result in a heavy landing or even worse a Dynamic Roll Over. We talk more about Dynamic Roll Over in exercise 24 sloping ground but a good understanding of it now will help in take-offs.

DYNAMIC ROLL OVER

The aircraft has a centre of gravity point. This is a point where its weight is said to act in relation to gravity. In a normal take-off we raise the collective and if the cyclic is in the right position then the aircraft lifts upwards. The lifting force is then in line with the centre of gravity. If however the cyclic is in the wrong position, say too far to the left, the lifting force is not in line with the centre of gravity and the aircraft will be more pulled leftward. Here's the problem. The R22 has a narrow undercarriage and a high centre of gravity point as the fuel tanks are located on top of the engine. It does not require therefore much incorrect cyclic input to pull the aircraft more to one side than upward. Once this starts the tendency of the pilot is to want to get the aircraft into the air, subsequently pulling more power and increasing the pull to the left. At this stage mass just takes over and even with full cyclic deflection to the right it may not be enough to stop the movement to the left and the aircraft rolls over. Although this type of accident is more common, it rarely causes injury, so doesn't make the statistics.

So what to do? Concentrate on your outside target as in exercise 8 **FOCUS**. Gently lift the lever until you can feel the aircraft go light on the skids. Slow down on lifting the collective. Be ready with left pedal. If you feel the aircraft lifting left, right or backwards, **LOWER THE LEVER FAST**. Put the weight back on the skids and start again.

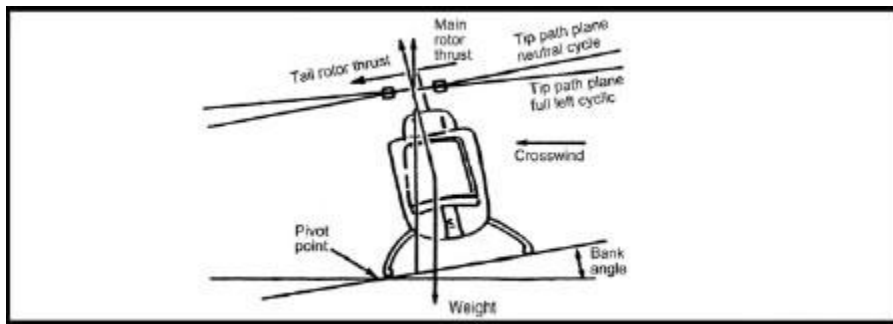


Figure 23-3: Dynamic Rollover

Landing:

Establish a steady 5ft hover as following on from exercise 8. Use outside references in order not to get disorientated with your height. Complete pre-landing checks. Look well ahead. Slowly lower the lever at the same time applying enough right pedal to keep your heading and right cyclic to maintain your position over the ground as the power comes off. Allow the aircraft to slowly sink lowering the lever and adjusting the pedals accordingly. The helicopter will touch down left skid first, it is important to maintain heading. Lower the lever further allowing the right skid to land then fully lower the lever.

It is very important during this exercise that there is no backwards or sideways movement to avoid dynamic roll over. If the landing does not appear to be going well raise the lever back to the 5 ft hover and start again. It's never a good thing to try and improve on a bad situation when you can start again. One of the most common faults students make is to lower the lever in sections or in a staggered manner. This upsets the air flow under the aircraft and affects the landing.

