3. Improper use of the controls during crosswind operations.
4. Failure to maintain proper rpm.

Normal Takeoff from a Hover

A normal takeoff from a hover is an orderly transition to forward flight and is executed to increase altitude safely and expeditiously. Before initiating a takeoff, the pilot should ensure that the proper checklist has been completed and the helicopter systems are within normal limits. During the takeoff, fly a profile that avoids the cross-hatched or shaded areas of the height/velocity diagram.

Technique

Refer to *Figure 9-12* (position 1). Bring the helicopter to a hover and perform a hover and systems check, which includes power, balance, and flight controls prior to continuing flight. The power check should include an evaluation of the amount of excess power available; that is, the difference between the power being used to hover and the power available at the existing altitude and temperature conditions. The balance condition of the helicopter is indicated by the position of the cyclic when maintaining a stationary hover. Wind necessitates some cyclic deflection, but there should not be an extreme deviation from neutral. Flight controls must move freely, and the helicopter should respond normally. Then, visually clear the surrounding area.

Start the helicopter moving by smoothly and slowly easing the cyclic forward (position 2). As the helicopter starts to move forward, increase the collective, as necessary, to prevent the helicopter from sinking and adjust the throttle to maintain rpm. The increase in power requires an increase in the proper antitorque pedal to maintain heading. Maintain a straight takeoff path throughout the takeoff.

While accelerating through effective translational lift (position 3), the helicopter begins to climb, and the nose tends to rise due to increased lift. At this point, adjust the collective to obtain normal climb power and apply enough forward cyclic to overcome the tendency of the nose to rise. At position 4, hold an attitude that allows a smooth acceleration toward climbing airspeed and a commensurate gain in altitude so that the takeoff profile does not take the helicopter through any of the cross-hatched or shaded areas of the height/velocity diagram. As airspeed increases (position 5), place the aircraft in trim and allow a crab to take place to maintain ground track and a more favorable climb configuration. As the helicopter continues to climb and accelerate to best rate-of-climb, apply aft cyclic pressure to raise the nose smoothly to the normal climb attitude.

Common Errors

1. Failing to use sufficient collective pitch to prevent loss of altitude prior to attaining translational lift.
2. Adding power too rapidly at the beginning of the transition from hovering to forward flight without forward cyclic compensation, causing the helicopter to gain excessive altitude before acquiring airspeed.
3. Assuming an extreme nose-down attitude near the surface in the transition from hovering to forward flight.
4. Failing to maintain a straight flightpath over the surface (ground track).
5. Failing to maintain proper airspeed during the climb.
6. Failing to adjust the throttle to maintain proper rpm.
7. Failing to transition to a level crab to maintain ground track.

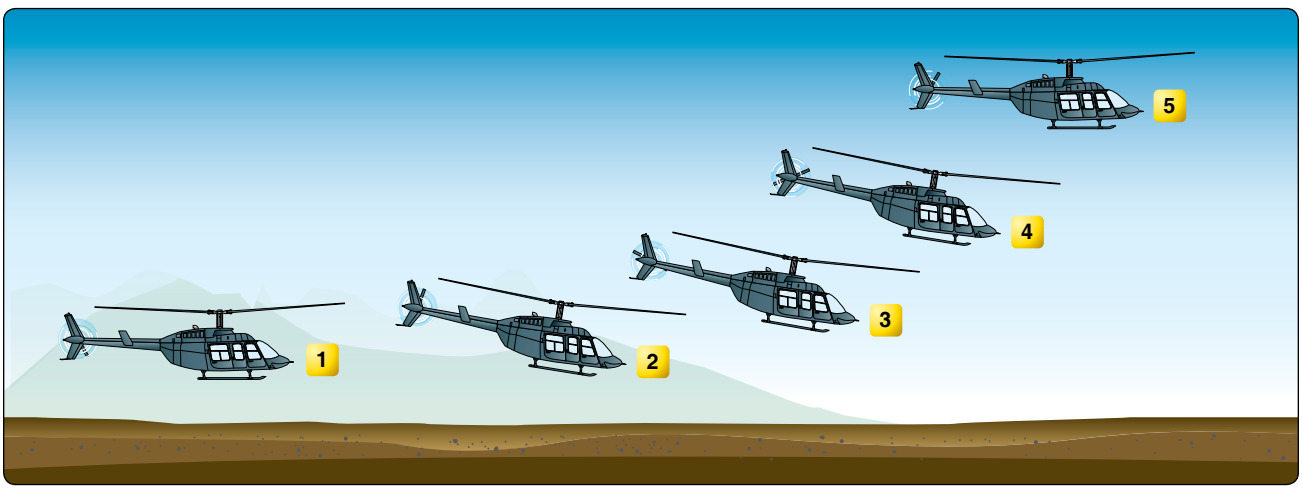

Figure 9-12. *The helicopter takes several positions during a normal takeoff from hover.*