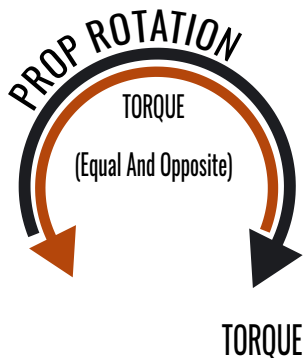
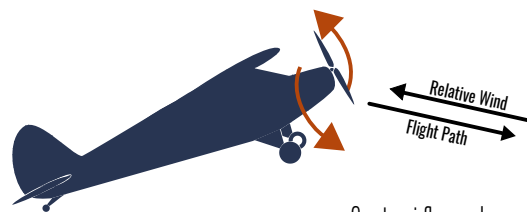


LEFT TURNING TENDENCIES



Relates to Newton's third law of motion
The equal-and-opposite force generated from the propeller rotating right is the airplane rotating left
Force increases with power

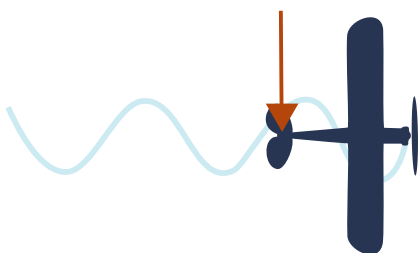


AOA

Greater airflow on descending blade. Effect increases with angle of attack (AOA) and higher power settings.

P-FACTOR

SPIRALING SLIPSTREAM

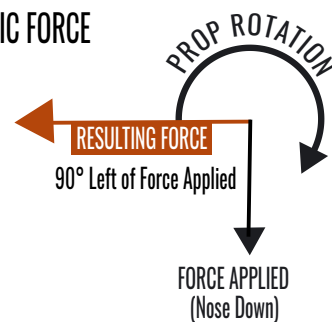


Airflow off the propeller strikes the left side of the vertical stabilizer.

Increases with power, but decreases with speed.

AIRSPEED

GYROSCOPIC FORCE

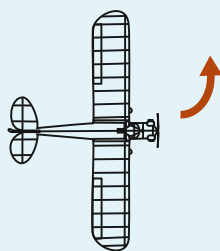


Gyroscopic precession from propeller rotation. Most noticeable in tailwheel aircraft on takeoff.

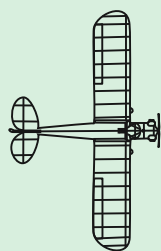
Increases with power and amount of force applied.

CONTROL FORCE

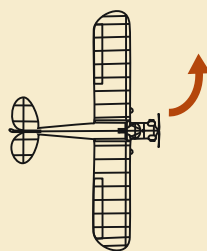
LEFT TURNING TENDENCIES IN A TAKEOFF ROLL



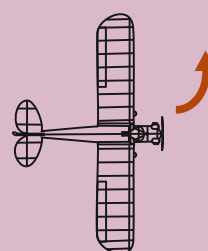
APPLY RIGHT RUDDER



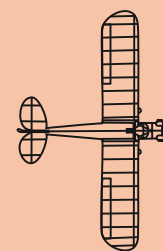
GRADUALLY REDUCE RIGHT RUDDER



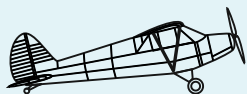
APPLY RIGHT RUDDER



APPLY RIGHT RUDDER

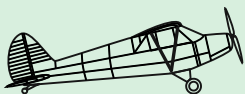


SLIGHT REDUCTION OF RIGHT RUDDER



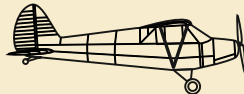
SET TAKEOFF POWER

Torque And Spiraling Slipstream



INITIAL ACCELERATION

Slipstream Force Decreases With Speed



LOWER NOSE (IF TAILWHEEL)

Gyroscopic Forces



ROTATE

P-Factor



CLIMB OUT

Slipstream Force Decreases With Speed

FORCE MAGNITUDE

TIME

These are approximations. Factors like airframe design and wind may change the dynamic. The best way to know if you're adjusting properly on takeoff is ensuring that the nose is aligned with the airplane movement, and that airplane movement is aligned with the runway.