drag and create a moment to yaw the WSC aircraft further from the straight flight. Therefore, fins are sometimes put on the carriage as needed so the carriage also has a yawing aerodynamic force to track the WSC aircraft directly into the wind. *[Figure 2-34]*

Figure 2-34. *Wheel fins for carriage yaw stability.*

Since the carriage has such a large effect on yaw stability, the carriage is matched to the wing for overall compatibility. Each manufacturer designs the carriage to match the wing and takes into account these unique factors of each design.

Yaw Stability Summary

These factors make the WSC aircraft track directly into the relative wind and eliminate the need for a rudder to make coordinated turns. Designs and methods vary with manufacturer and wing type, but all WSC wings are designed to track directly into the relative wind.

Thrust Moments

WSC aircraft designs can have different moments caused by thrust based on where the thrust line is compared to the CG. This is similar to an airplane except the WSC aircraft has no horizontal stabilizer that is affected by propeller blast.

If the propeller thrust is below the CG *[Figure 2-35,* top*]*, this creates a pitch-up moment about the CG when thrust is applied and a resultant decrease in speed. When reducing the throttle, it reduces this moment and a nose pitch down results with an increase in speed.

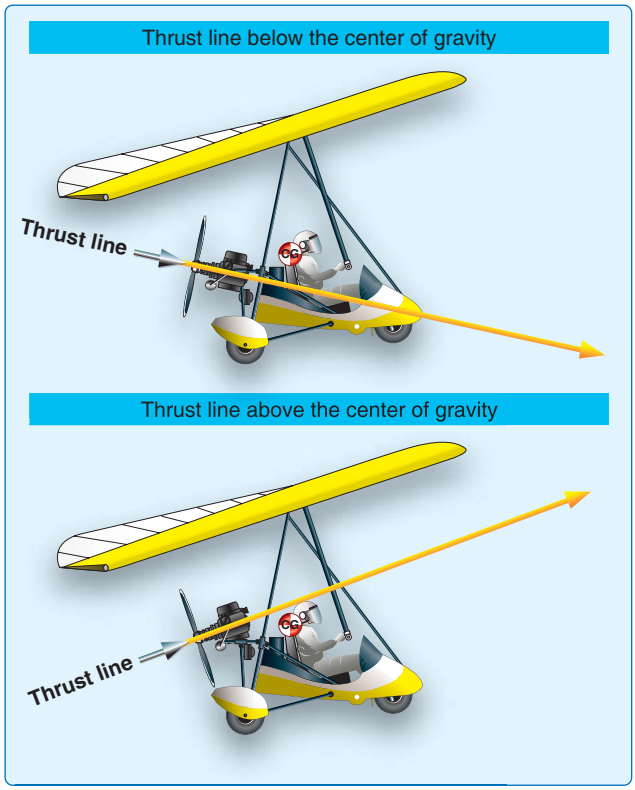

Figure 2-35. *Thrust line moments.*

If the propeller thrust is above the CG *[Figure 2-35,* bottom*]*, this creates a pitch-down moment about the CG when thrust is applied and a resultant increase in speed. When reducing the throttle, it reduces this moment and a nose pitch up results with a decrease in speed.

With the thrust line above or below the CG producing these minor pitch and speed changes, they are usually minor for most popular designs. Larger thrust moments about the CG may require pilot input to minimize the pitch and speed effects. Most manufacturers strive to keep the thrust as close as possible to the vertical CG while also balancing the drag of the carriage and the wing for its speed range. This is why the carriage must be matched to the wing so these characteristics provide a safe and easy to fly WSC aircraft.

Stalls: Exceeding the Critical AOA

As the AOA increases to large values on the wing chord, the air separates starting at the back of the airfoil. As the AOA increases, the separated air moves forward towards the leading edge. The critical AOA is the point at which the wing is totally stalled, producing no lift—regardless of airspeed, flight attitude, or weight. *[Figure 2-36]*