

FAA-S-ACS-25
Task AI.X.B. Demonstration of Flight Characteristics at Various Configurations and Airspeeds

- Elements:
- AI.X.B.S5b With gear and flaps retracted (as applicable), slow the airplane to, and maintain, best glide speed (or as specified by evaluator), noting the power setting required,
- AI.X.B.S5f Without changing power setting, lower the pitch attitude and accelerate to a faster airspeed until reestablishing the airplane in level flight, noting the new airspeed and amount of altitude lost, then;

Comment:

1. The purpose of element AI.X.B.S5f is to demonstrate that the aircraft will stabilize at a higher airspeed for the same power setting once the aircraft is on the front side of the power curve.
2. To perform this element as envisioned by ACS Working Group: Without adjusting the power from AI.X.B.S5d, lower the pitch attitude and accelerate to at least V_{glide} , then level off, reestablishing the airplane in steady-state level flight. Applicant notes the new airspeed. Applicant explains why the airspeed differs from that noted in element AI.X.B.S5d with the same power setting.
3. The altitude criteria in element S1 was not envisioned by the ACS Working Group members as applying to element S5f, but it could. Like leveling off at the end of a Chandelle, the applicant could very slowly increase the airspeed without losing 100 feet. The working group only advises. The ACS is now published and considered regulatory. The FAA decides exactly what this task is and how they want it performed. Personally, I like the more forceful pushover because it correlates better with stall avoidance and recovery techniques.
3. Explanation: Figure 11-14 in the PHAK (rev c), Power Required Curve. This is a good chart to use to explain this element.

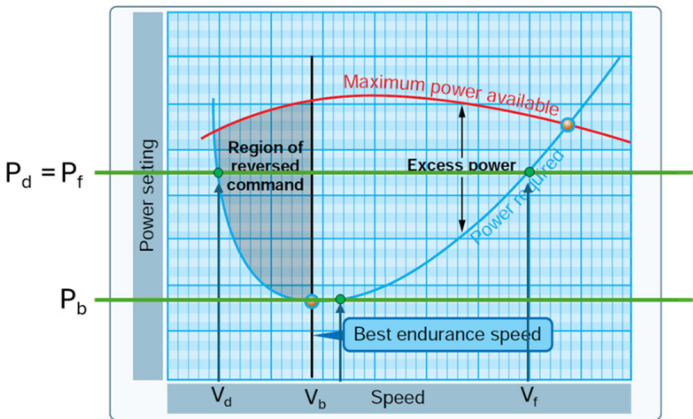


Figure 11-14. Power required curve.

- I have added the following variables to Figure 11-14 below:
- P_b = noted power setting in element S5b
 P_d = noted power setting in element S5d
 P_f = noted power setting in element S5f
- V_b = indicated airspeed in element S5b
 V_d = indicated airspeed in element S5d
 V_f = indicated airspeed in element S5f

If the airspeed and power setting just above stall is V_d , then there is another speed, V_f , at the same power setting.

Element S5f is to demonstrate that this other airspeed can be found simply by a) lowering the nose which decreases induced drag, b) allowing the plane to accelerate above V_{glide} and then reestablishing steady-state level flight.

The applicant should understand that the difference is caused by the high induced drag at low speeds/high angle of attack. From an energy management perspective, the energy that was needed to overcome high induced drag is now available to increase airspeed.

The applicant should be able to correlate this to stall-recovery procedures which also include lowering the nose to reduce AOA and increasing airspeed as part of the recovery.