

V.G. Before Takeoff Check

Objectives	The student should develop knowledge of the elements related to taxiing an airplane as required in the necessary ACS.
Key Elements	<ul style="list-style-type: none">✦ Departure brief✦ Incursions and hazards
Elements	<ul style="list-style-type: none">✦ Temperatures and pressures✦ Positioning the aircraft✦ Division of attention✦ Checklist✦ Go/No-go decision✦ Departure brief✦ Clearing the takeoff area of hazards✦ Avoiding incursions
Schedule	<ol style="list-style-type: none">1. Discuss objectives2. Review material3. Development4. Conclusion
Equipment	<ul style="list-style-type: none">✦ White board✦ Markers✦ References
Instructor's Actions	<ol style="list-style-type: none">1. Discuss lesson objectives2. Present lecture3. Questions4. Homework
Student's Actions	Participate in discussion Take notes
Completion Standards	The student understands the elements involved in a proper, thorough, and safe before takeoff check and can make a safe decision as to whether the airplane is safe to fly and can maintain hazard and incursion avoidance.

References

FAA-H-8083-3B, *Airplane Flying Handbook* (Chapter 2)
POH

Instructor Notes

Introduction

Overview—review objectives and key ideas.

What—a systematic procedure for checking the engine, controls, systems, instruments, and avionics prior to flight.

Why—a final check before takeoff ensures that the airplane is ready for safe flight before getting into the air.

Temperatures and pressures

Check after taxiing to a position near the takeoff runway (the run-up area) to allow time to warm up to minimum operating temperatures for lubrication and internal engine clearances. Oil temperature must reach a minimum value (75°).

Scan all engine instruments periodically to ensure they are appropriate for run-up and takeoff.

Positioning the aircraft

Position on a firm surface that is free of debris for the run-up.

Position diagonally so that the propeller will not blast anything behind the aircraft, into the wind to prevent overheating and to get more accurate indications. After positioning, allow the aircraft to move forward slightly to straighten the nosewheel. Considerable stress is placed on the nose wheel during the run-up.

CE—improper positioning of the airplane.

Division of attention

Divide attention inside and outside the airplane.

Pay attention to make sure the aircraft does not move forward unnoticed.

Checklist

Use the manufacturer's before takeoff checklist and follow it item by item. Be critical of the aircraft's performance—determine whether it meets the guidelines in the POH and do not accept deteriorating performance.

CE—failure to properly use the appropriate checklist.

Check the controls visually for proper position and movement. Move the controls freely in the full range of positions.

CE—an improper check of flight controls.

Go/No-go decision

The PIC is responsible for determining whether the airplane is in a condition for safe flight. Stop at any discrepancy and note its effects—consider whether it is still legal. Return to the ramp for further investigation when in doubt.

Marginal performance may lead to a hazardous condition.

CE—improper acceptance of marginal engine performance.

Departure takeoff

Review performance speeds, expected takeoff distance, and emergency procedures. Announce the speeds.

- ✈ V_R
- ✈ V_X
- ✈ V_Y

Emergencies—if you lose power on the roll, close the throttle and maintain control with the rudder/brakes. After rotation, land on the remaining runway (~50' AGL).

CE—hazards of failure to review takeoff and emergency procedures.

Clearing the takeoff area of hazards

Visually check the area to make sure there are no aircraft, vehicles, people, livestock, or wildlife.

If at a non-towered airport, announce intentions on CTAF and make a 360° turn in the pattern direction.

Avoiding incursions

- ✈ Before moving, clear to the left, right, and center.
- ✈ Know where other aircraft are in relation to you. Traffic separation is not ATC's responsibility.
- ✈ Monitor the appropriate frequencies.
- ✈ Repeat all clearances and do not cross hold short lines without clearance.
- ✈ If in doubt, wait for the traffic to clear.
- ✈ Clear the final approach area before taxiing into the takeoff position.

CE—failure to avoid incursions and to ensure no conflict with traffic prior to taxiing into the takeoff position.

Common errors

- ✈ Failure to properly use the appropriate checklist.
- ✈ Improper positioning of the airplane.
- ✈ Improper acceptance of marginal engine performance.
- ✈ Improper check of flight controls.
- ✈ Hazards of failure to review takeoff and emergency procedures.
- ✈ Failure to avoid runway incursions and to ensure no conflict with traffic prior to taxiing into the takeoff position.

Conclusion

Brief review of main points.

Use the before takeoff checklist to ensure that there are no problems prior to takeoff. Make a safe decision regarding whether to make the flight. Do not ignore runway incursion and hazard avoidance.

CFI PTS

Objective: To determine that the applicant:

1. Exhibits instructional knowledge of the elements of the before takeoff check by describing:
 - a. Positioning the airplane with consideration for other aircraft, surface conditions, and wind.
 - b. Division of attention inside and outside the cockpit.
 - c. Importance of following the checklist and responding to each checklist item.
 - d. Reasons for assuring suitable engine temperatures and pressures for run-up and takeoff.
 - e. Method used to determine that airplane is in a safe operating condition.
 - f. Importance of reviewing takeoff performance airspeeds, expected takeoff distances, and emergency procedures.
 - g. Method used for assuring that the takeoff area or path is free of hazards.
 - h. Method of avoiding runway incursions and ensuring no conflict with traffic prior to taxiing into takeoff position.
2. Exhibits instructional knowledge of common errors related to the before takeoff check by describing:
 - a. Failure to properly use the appropriate checklist.
 - b. Improper positioning of the airplane.
 - c. Improper acceptance of marginal engine performance.
 - d. An improper check of flight controls.
 - e. Hazards of failure to review takeoff and emergency procedures.
 - f. Failure to avoid runway incursions and to ensure no conflict with traffic prior to taxiing into takeoff position.
3. Demonstrates and simultaneously explains a before takeoff check from an instructional standpoint.
4. Analyzes and corrects simulated common errors related to a before takeoff check.

PPL ACS

Task	F. Before Takeoff Check
References	FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-23; POH/AFM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with the before takeoff check.
Knowledge	The applicant demonstrates understanding of:
PA.II.F.K1	Purpose of pre-takeoff checklist items including:
PA.II.F.K1a	a. Reasons for checking each item
PA.II.F.K1b	b. Detecting malfunctions
PA.II.F.K1c	c. Ensuring the airplane is in safe operating condition as recommended by the manufacturer
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
PA.II.F.R1	Division of attention while conducting pre-flight checks.
PA.II.F.R2	Unexpected runway changes by ATC.
PA.II.F.R3	Wake turbulence.
Skills	The applicant demonstrates the ability to:
PA.II.F.S1	Review takeoff performance.
PA.II.F.S2	Complete the appropriate checklist.
PA.II.F.S3	Properly position the airplane considering other aircraft, vessels, and wind.
PA.II.F.S4	Divide attention inside and outside the flight deck.
PA.II.F.S5	Verify that engine parameters and airplane configuration are suitable.

CPL ACS

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