AIRCRAFT FLASHCARDS

Courtesy of the Air Safety Institute, a Division of the AOPA Foundation, and made possible by AOPA Services Corporation.

Knowing your aircraft well is essential to safe flying. These flash cards are designed to help pilots of all experience levels gain that knowledge. The blanks on the cards should be filled out **after** reviewing the pilot's operating handbook (POH) and other relevant material.

Professional pilots often use aircraft-specific flash cards as a way of reviewing speeds, profiles, systems, and emergency procedures any time and anywhere. Now you can too.

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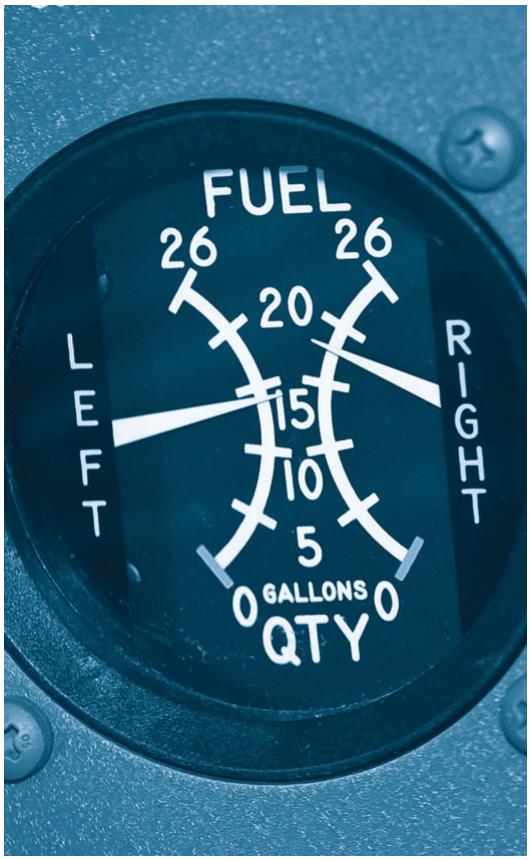


Fuel Capacity

Fuel Capacity

Total:_____gal Usable:_____ gal

Max Fuel Imbalance: _____ gal

Note: Some aircraft have long range and/or tip tanks. Make sure you use the correct “usable” fuel amounts for your aircraft’s endurance calculations.

Fuel System

Fuel System

Circle the type(s) of fuel system(s) in your aircraft:

- ☐ Gravity-fed
- ☐ Pump Driven
- ☐ Fuel-injected
- ☐ Carbureted

Fuel Drains & Locations

Fuel Drains & Locations

Number of Drains:_____

Locations: _____

_____

_____

_____

Note: Most of the time, drains are located under the wings and nose.

Fuel Type & Weight

Fuel Type & Weight

Type (avgas, jet, etc.):_____

Weight: _____ lb/gal

Color:_____

Oil

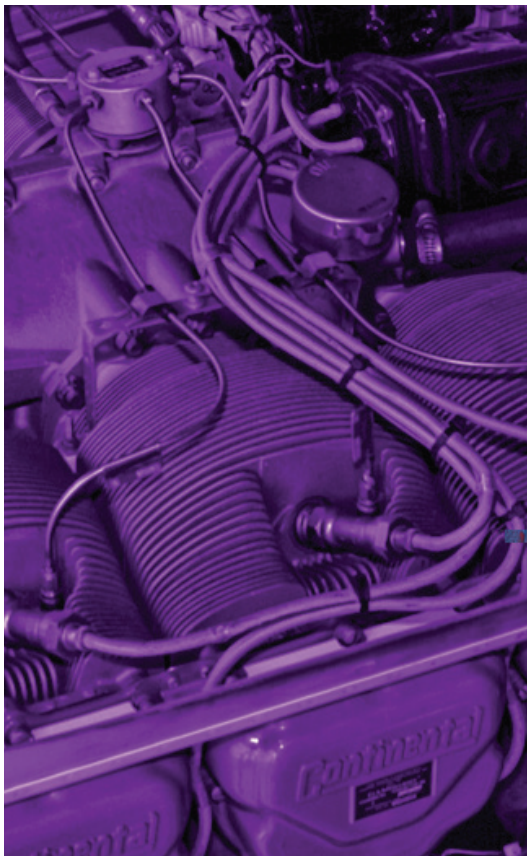
Oil

Minimum:_____

Maximum: _____

Grade: _____

Note: Your aircraft may require different types and grades of oils during the engine break-in period and during warmer and colder weather.



Engine

Engine

Make: _____ Model: _____

Horsepower: _____ Max RPM:_____

Note: Engine model numbers can tell you a lot. For example, a C172R has a Lycoming IO-360 engine. The “I” means fuel injected and the “O” means the cylinders are horizontally opposed. The “360” refers to cubic inches of displacement, describing the physical size of the engine.

Electrical System

Electrical System

Alternator Voltage: _____ Battery Voltage: _____

Alternator Amperage:_____

Abnormal Indications & Warnings:_____

_____

_____

Note: Electrical component amperage is listed on the faces of the circuit breakers. Turning OFF the components with the largest draw will lengthen the life of the battery following an alternator failure.

Magneto Check

Magneto Check

Runup RPM: _____

Maximum RPM Drop: _____

Max Difference Between Left & Right: _____

Note: Question on how magnetos work? Check out the Air Safety Institute's *Engine & Propeller* online course at airsafetyinstitute.org/engineprop.

Nosewheel Steering

Nosewheel Steering

☐ Steerable through _____ degrees

or

☐ Free Castering

Note: This is important when maneuvering the aircraft on the ground with a tug and/or tow bar. Look for markings on the nosewheel strut, wheel pant, or cowling that indicate the steering limit. This does not apply if the nosewheel is free castering.

Antennas

Antennas

Type: Location:

_____ _____

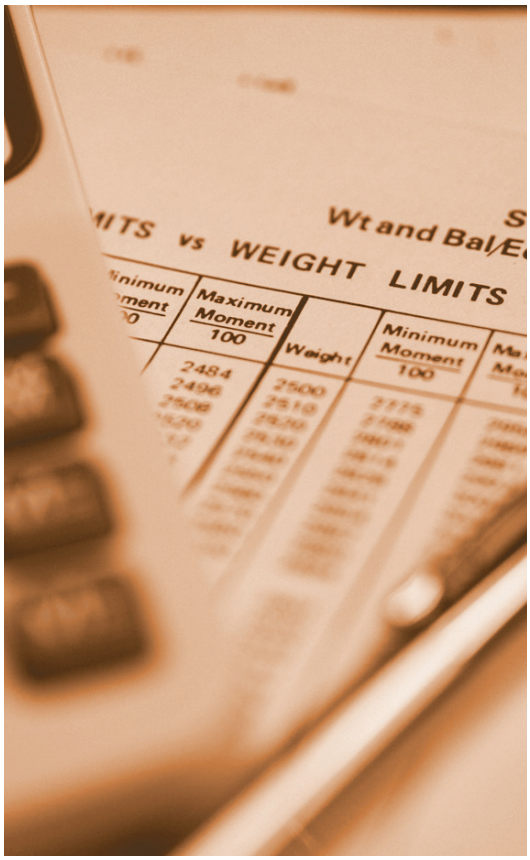
_____ _____

_____ _____

_____ _____

_____ _____

Note: Aircraft antenna locations vary based on the aircraft make/model and equipment installed.



Maximum Weights

Maximum Weights

Maximum Ramp Weight: _____ lb

Maximum Takeoff Weight: _____ lb

Maximum Landing Weight:_____ lb

Note: Maximum ramp weight includes the weight of fuel needed to taxi and complete the runup. This is why the maximum ramp weight may exceed the maximum takeoff weight in the normal category.

V_{NE}

V_{NE} - Never Exceed Speed

_____ knots

Note: V_{NE} is denoted by the red line. Exceeding V_{NE} may cause severe structural damage or failure of your aircraft.

V_{NO}

V_{NO} - Maximum Structural Cruising Speed

_____ knots

Note: V_{NO} is shown where the green and yellow arcs meet. It should not be exceeded except in smooth air.

V_A

V_A - Maneuvering Speed

At Max. Gross Weight _____ knots

Note: V_A is the maximum speed at which you may apply full control deflections without over-stressing the airplane. V_A decreases as weight decreases. Pilots should fly below this speed in severe turbulence.

V_Y

V_Y - Best Rate of Climb

_____ knots

Note: V_Y delivers the greatest altitude gain over a given period of **time**. In other words, V_Y delivers you the most feet/minute.

V_x

V_x - Best Angle of Climb

_____ knots

Note: VX delivers the greatest altitude gain over a given **distance**.

V_R

V_R - Rotation Speed

Normal: _____ knots

Short-field: _____ knots

Soft-field: _____ knots

Note: On some aircraft, this is **not** marked on the airspeed indicator and will change depending on the aircraft's weight and takeoff procedure.

V_{FE}

V_{FE} - Maximum Flap Extension Speed

Increment:	Speed:	
_____	_____	knots
_____	_____	knots
_____	_____	knots
_____	_____	knots

Note: Flap operating range is usually shown on the airspeed indicator by the white arc. Often, the first flap extension speed is above the white arc. Check your POH for exact values.

V_{SO}

V_{SO} - Stall Speed—Landing Configuration

_____ knots at 0° Bank

_____ knots at 60° Bank

Note: V_{SO} is shown on the bottom of the white Arc.

Remember: V_{SO} = "Stuff Out," which means gear and flaps extend.

V_{S1}

V_{S1} - Stall Speed—Clean

_____ knots at 0° Bank

_____ knots at 60° Bank

Note: V_{S1} is shown on the bottom of the green arc.

Remember: V_{S1} = "Stuff In," which means gear and flaps retracted.

Normal Takeoff Procedures

Normal Takeoff Procedures

Flap Setting: _____

Rotation Speed: _____ knots

Climb Speed:_____ knots

Normal Landing Procedures

Normal Landing Procedures

Leg	Power Setting	Flap Setting	Airspeed
Crosswind:	_____	_____	_____ knots
Downwind:	_____	_____	_____ knots
Base:	_____	_____	_____ knots
Final:	_____	_____	_____ knots

Note: Memorizing proper power settings and airspeeds for each segment of the approach will help stabilize the approach and landing.

Short-Field Landing Procedures

Short-Field Landing Procedures

Leg	Power Setting	Flap Setting	Airspeed
Crosswind:	_____	_____	_____ knots
Downwind:	_____	_____	_____ knots
Base:	_____	_____	_____ knots
Final:	_____	_____	_____ knots

Note: The objective of the short-field landing is to transfer the aircraft's weight from the wings to wheels as soon as possible. Touch down as slowly as possible, while simultaneously applying maximum braking.

Short-Field Takeoff Procedures

Short-Field Takeoff Procedures

Flap Setting: _____

Rotation Speed: _____

Climb Speed:_____ knots

Flap Retraction: _____ knots

Note: The objective of the short-field takeoff is to transition from the takeoff roll to best-angle-of-climb speed as quickly, efficiently, and safely as possible. This generally means using minimal runway length, neutral elevator for low drag, proper flap setting, and avoiding lifting off too soon.

Soft-Field Landing Procedures

Soft-Field Landing Procedures

Leg	Power Setting	Flap Setting	Airspeed
Crosswind:	_____	_____	_____ knots
Downwind:	_____	_____	_____ knots
Base:	_____	_____	_____ knots
Final:	_____	_____	_____ knots

Note: The objective of a soft-field landing is to have the wings support the aircraft's weight as long as possible, which helps minimize the chance of sinking in the soft soil. Touch down as softly as possible, and avoid unnecessary braking. You may need to add power in the flare to avoid a hard landing.

Soft-Field Takeoff Procedures

Soft-Field Takeoff Procedures

Climb Speed:_____ knots

Flap Setting: _____

Flap Retraction: _____ (airspeed or altitude)

Note: Hold full aft elevator while taxiing into position and avoid unnecessary stopping or braking. Smoothly advance the throttle while maintaining back pressure on the yoke, and then slowly reduce the amount of back pressure after the nose wheel lifts off the ground as speed increases. After the aircraft becomes airborne, adjust its pitch attitude to remain in ground effect until reaching the proper climb speed.

Best Glide Speed

Best Glide Speed

_____ knots

Note: Most light general aviation aircraft will glide about two miles for every 1,000 feet of altitude. Usually you'll want to extend the glide as long as possible by strictly maintaining the best glide speed and keeping the aircraft's configuration clean (e.g., gear and flaps up, feathered prop).

Maximum Demonstrated Crosswind Component

Maximum Demonstrated Crosswind Component

_____ knots

Note: This is the maximum crosswind in which the aircraft was tested during certification. Although it is not technically a limitation, it should be treated as one as directional control effectiveness decreases as crosswind velocity increases.

Types of Operations

Types of Operations

- ☐ Night
- ☐ IFR
- ☐ Known Icing

Note: Even if an aircraft has deice or anti-ice equipment, it may not be certified for flight into known icing conditions. In fact, few light general aviation aircraft have this certification. Either way, having this equipment does not guarantee prolonged, safe flights in icing conditions.

Emergency Procedures: Engine Failure

Emergency Procedures: Engine Failure

Memory Items: _____

_____

_____

_____

_____

_____

Emergency Procedures: Engine Fire on Start

Emergency Procedures: Engine Fire on Start

Memory Items: _____

_____

_____

_____

_____

_____

Emergency Procedures: Engine Fire in Flight

Emergency Procedures: Engine Fire in Flight

Memory Items: _____

_____

_____

_____

_____

_____

Emergency Procedures: Electrical Fire in Flight

Emergency Procedures: Electrical Fire in Flight

Memory Items: _____

_____

_____

_____

_____

Note: Electrical fires are usually smelled long before they are seen.

Emergency Procedures: Inadvertent Icing Encounter

Emergency Procedures: Inadvertent Icing Encounter

Note: Due to lack of anti- or deice equipment, most light general aviation aircraft are not approved for flight into icing conditions. If the aircraft is not equipped and certified for icing, you must exit icing conditions immediately. If you have an inadvertent icing encounter in an aircraft without windshield anti-ice, adjust the defroster setting to provide maximum heat to help keep a portion of the windshield clear. Turn off the cabin heat, if that will provide more heat to the windshield. Remember to turn on the pitot heat, as well.

Spin Recovery

Spin Recovery

Memory Items: _____

_____

_____

_____

_____

Note: Some pilots commit to memory the **PARED** acronym, which means **P**ower-reduce, **A**ilerons-neutral, **R**udder-full opposite, **E**levator-forward to break the stall, and **D**ive-recover. Consult your aircraft's POH for specific procedures.