

**CHAPTER 2
AIRCRAFT INFORMATION SUMMARY**

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General

This section presents a partial summary of the operating limitations and aircraft information necessary for the safe operation of the C172R Skyhawk. This section is provided for quick reference only, and is not intended to substitute the approved Aircraft Flight Manual and other official materials.

All BSU Aircraft are operated in accordance with the FAA regulations and BSU Aviation policies and procedures. In some cases, BSU policies and procedures will be more restrictive. Pilots shall refer to the BSU AOM and be familiar with all general BSU aircraft operating procedures.

In all cases, pilots operating the BSU Cessna C172R Skyhawk shall be thoroughly familiar with the information contained in the approved Aircraft Flight Manual, FAA regulations and applicable BSU Aviation policies and procedures.

CAUTION

Observance of these limitations is mandatory. This chapter provides only a partial summary of limitations in accordance with the Aircraft Flight Manual. Pilots must refer to the Aircraft Flight Manual and BSU Aviation Operations manual to become familiarize with all required information.

NOTE

For aircraft equipped with specific options, refer to the Pilot's Information Manual (PIM) and FAA Approved Airplane Flight Manual (AFM) for amended operating limitations, procedures, performance data and/or other necessary information.

Kinds of Operations

The airplane is approved for the following operations when equipped in accordance with 14 CFR Part 91:

- **Day V.F.R.**
- **Night V.F.R.**
- **Day I.F.R.**
- **Night I.F.R.**
- **Non-icing**

CAUTION

*The BSU C172R Skyhawk is not equipped for flight into icing conditions.
Flight into known icing conditions is PROHIBITED.*

Structural and Weight Limitations

Maximum Ramp Weight (Normal Category).....	2,457 lbs
Maximum Takeoff Weight (Normal Category).....	2,450 lbs
Maximum Landing Weight (Normal Category).....	2,450 lbs
Maximum Ramp Weight (Utility Category).....	2,107 lbs
Maximum Takeoff Weight (Utility Category).....	2,100 lbs
Maximum Landing Weight (Utility Category).....	2,100 lbs
Baggage Area 1 Maximum Weight	120 lbs
Baggage Area 2 Maximum Weight	50 lbs
Combined Max Weight Baggage Areas 1 and 2.....	120 lbs

Maneuvering Limitations

The C172R Skyhawk is rated in the Normal and Utility categories. The only authorized maneuvers in the Skyhawk in Normal category are those maneuvers incidental to normal flying, stalls (except whip stalls), lazy eights, chandelles, and steep turns (with not more than 60⁰ of bank).

In the Utility category, the only authorized maneuvers are those in the Normal category, plus spins.

WARNING
When operated in the Utility category, the rear seat must not be occupied and the baggage compartment must be empty.

Flight Load Factor Limitations - Normal Category

Positive Load Limit

+3.8 g Flaps Up / +3.0 g Flaps Down

Negative Load Limit

-1.52 g Flaps Up

Flight Load Factor Limitations - Utility Category

Positive Load Limit

+4.4 g Flaps Up / +3.0 g Flaps Down

Negative Load Limit

-1.76 g Flaps Up

Power Plant Limitations

Manufacturer.....	Textron / Lycoming
Model Numbers	IO-360-L2A
Maximum Horsepower	160 BHP
Maximum Engine Rotation Speed (RPM).....	2400
Fuel Minimum Grade.....	100 (Green) / 100 LL (Blue)

Engine Starter Limitations

Minimum voltage to attempt engine start	20 Volts
Maximum continuous cranking time (single start attempt)	10 seconds
Minimum cool-down time between attempts	20 seconds
Maximum number of start attempts	3

Engine Operating Limitations (all operations)

Maximum Continuous Power	160 bhp @2400 RPM
Maximum RPM for all operations	2400 RPM
Static RPM range at full throttle (takeoff power)	2065-2165 RPM
Maximum oil temperature (red line)	245°
Minimum oil pressure	20 PSI

NOTE

Proper engine (oil) temperature management is critical to air-cooled engine reliability and maximum service life. Flight crews will monitor oil temperature and adjust airspeed, climb gradient and power/mixture settings, as appropriate, in accordance with the AFM and above limitations for all operations.

Oil Limitations

Maximum Oil Capacity (per engine)	8 qts
Minimum Oil Quantity (per engine) / Flight of under 2 hours (BSU Policy)	6 qts
Minimum Oil Quantity (per engine) / Flight of 2 hours or more (BSU Policy)	7 qts

CAUTION

Do not operate the engine with less than six (6) quarts of oil.

Propeller Specifications and Limitations

Manufacturer	McCauley / Model 1C235/ LFA7570
Type	Fixed pitch
Max. Diameter	75"
Min. Diameter	74"

Fuel Limitations

Approved Fuel	Aviation Grade 100LL (Blue) or 100 (Green)
Total Capacity (all tanks)	56 Gallons
Total Usable Fuel (all tanks)	53 Gallons
Total Unusable Fuel (all tanks)	3 Gallons
Usable Fuel (each wing)	26.5 gallons
Unusable Fuel (each wing)	1.5 Gallons

WARNING

The fuel selector must be set in the **BOTH** position for takeoff.
Avoid continuous operations with the fuel selector positioned on the RIGHT or LEFT tank.

CAUTION

Flight crews shall avoid maneuvers that could uncover or “un-port” the wing outlet in the fuel tanks. Un-porting can result in fuel flow interruption and power loss. Avoid extreme running takeoffs, slips/skids resulting in altitude loss in excess of 2000’, or other radical or extreme maneuvers.

Electrical System Limitations

Alternator Output 28 Volts
 Amps Load Maximum 60 Amps
 Battery Output 24 Volts
 Minimum voltage to attempt engine start 20 Volts

WARNING

**Alternator must be functional to initiate a flight.
 Departing on battery power alone, without a functional alternator, is prohibited.**

Airspeed Limitations

Airspeed Indicator Markings

Instrument Marking	Explanation	KIAS
White Arc	Full Flap Operating Range: Lower limit is max. weight V_{SO} in the landing configuration. Upper limit is maximum speed permissible with flaps fully extended.	33 - 85
Green Arc	Normal Operating Range: Lower limit is max. weight V_{S1} with flaps retracted. The upper limit is V_{NO} .	44 - 129
Yellow Arc	Caution Range: Flight in this range is limited to smooth air only, and then with caution.	129 – 163
Red Line	Never Exceed Speed: Maximum speed for all operations.	163

NOTE

The maximum demonstrated crosswind component for this aircraft is **15 KNOTS**.
 The maximum crosswind component allowed for any BSU C172R operations is **15 KNOTS**, unless specifically authorized otherwise prior to flight.

NORMAL OPERATIONS AIRSPEEDS

Symbol	Reference	Definition	KIAS
$V_{FE(full)}$	Max Full Flap Extend Speed	Do not exceed this speed with wing flaps extended beyond 10°.	85
$V_{FE(10)}$	Max 10 ° Flap Extend Speed	Do not exceed this speed with wing flaps extended 10°.	110
V_A	Maneuvering Speed	Do not make full or abrupt control movements above this speed. 2450 lbs. 2000 lbs. 1600 lbs.	99 92 82
V_{NO}	Max Structural Cruising Speed	Do not exceed this speed except in smooth air, and then only with extreme caution	129
V_{NE}	Never Exceed Speed	Maximum speed for all operations.	163
V_{S1}	Stall Speed, Specified Configuration	Stall speed in a specified configuration, flaps up	44
V_{SO}	Stall Speed, Landing Configuration	Stall speed in the landing configuration, typically flaps down	33
V_r	Rotation speed	Rotate at this speed on take-off	55
V_X	Best Angle of Climb (max climb over distance)	Maintain this speed until clear of obstacles, to gain maximum altitude in minimum forward distance	60
V_Y	Best Rate of Climb (max vertical speed in climb)	Maintain this speed to gain greatest altitude in minimum time	79
V_{climb}	Enroute or cruise climb speed	Maintain this speed for the best combination of visibility, engine cooling and climb performance	90
Traffic Pattern	Typical speed to be maintained at TPA, if appropriate	Maintain this airspeed in the downwind leg of a traffic pattern	90
$V_{ref(normal)}$	Final approach speed / NORMAL landing	Maintain this airspeed on final approach (with no gusts)	65
$V_{ref(short)}$	Final approach speed / SHORT-FIELD landing	Maintain this airspeed on final approach (with no gusts)	61
$V_{ref(no\ flap)}$	Final approach speed / NO FLAP landing	Maintain this airspeed on final approach (with no gusts)	70
X/W component	Maximum crosswind component on takeoff and landing	Do not intentionally exceed this crosswind component on takeoff and landing	15

EMERGENCY OPERATIONS AIRSPEEDS

Symbol	Reference	Definition	KIAS
$V_{ref(no\ flap)}$	Final approach speed / NO FLAP landing	Maintain this airspeed on final approach during no-flap landings (with no gusts)	70
V_G	Best Glide Speed (engine inoperative)	Maintain this speed with the engine inoperative	65
Window Open	Max window open speed	Do not open the window above this speed	163

Training maneuvers limitations

WARNING

All intentional aerobatic maneuvers are prohibited.

Spins require prior approval.

Min. altitude for any portion of stalls and slow flight, including recovery, is 1500' AGL.

Intentional banks in excess of 60° are prohibited.