

STRUCTURES

All structures are of aluminum alloy construction and are designed to ultimate load factors well in excess of normal requirements. All exterior surfaces are primed with etching primer and painted with acrylic lacquer.

The wings are attached to each side of the fuselage by inserting the butt ends of the respective main spars into a spar box carry through which is an integral part of the fuselage structure, providing, in effect, a continuous main spar with splices at each side of the fuselage. There are also fore and aft attachments at the rear spar and at an auxiliary front spar.

The wing airfoil section is a laminar flow type, NACA652-415 with the maximum thickness about 40% aft of the leading edge. This permits the main spar carry through structure to be located under the rear seat providing unobstructed cabin floor space ahead of the rear seat.

LANDING GEAR

The three landing gears use a Cleveland 6.00 x 6 wheel, the main wheels being provided with brake drums and Cleveland single disc hydraulic brake assemblies. The nose wheel and the main gear both use 6.00 x 6 four ply tires. All the tires have tubes.

The nose gear is steerable through a .44° arc by use of the rudder pedals. A spring device is incorporated in the rudder pedal torque tube assembly to aid in rudder centering and to provide rudder trim. The nose gear steering mechanism also incorporates a hydraulic shimmy dampener.

The oleo struts are of the air-oil type with normal extension being 3.25 inches for the nose gear and 4.50 inches for the main gear under normal static (empty weight of airplane plus full fuel

and oil) load.

The brakes are actuated by a hand lever and a master cylinder which is located below and near the center of the instrument panel. The toe brakes and the hand lever have their own brake cylinders but they both use a common reservoir. The parking brake is incorporated in the lever brake and is operated by pulling back on the lever and depressing the knob attached to the top of the handle. To release the parking brake, pull back on the brake lever to disengage the catch mechanism; then allow the handle to swing forward.

CONTROL SYSTEM

Dual controls are provided as standard equipment with a cable system used between the controls and the surfaces. The horizontal tail is of the all movable slab type, with an anti-servo tab acting as a longitudinal trim tab. It is actuated by a control on the cabin ceiling. The stabilator provides extra stability and control with less size, drag, and weight than conventional tail surfaces. The differential action of the ailerons tends to eliminate adverse yaw in turning maneuvers and reduces the amount of coordination required in normal turns.

The flaps are manually operated, balanced for light operating forces and spring loaded to turn to the up position. A past-center lock incorporated in the actuating linkage holds the flap when it is in the up position so that it may be used as a step on the right side. The flap will not support a step load except when in the full up position, so it must be completely retracted when used as a step. The flaps have three extended positions, 10, 25 and 40 degrees.

terminal.

3. Insert plug of jumper cable into socket located on aircraft fuselage.

4. Turn aircraft MASTER SWITCH to ON and proceed with NORMAL engine starting technique.

5. After engine has been started, turn MASTER SWITCH to OFF and remove jumper cable plug from aircraft.

6. Turn aircraft MASTER SWITCH to ON and check alternator ammeter for indication of output. DO NOT ATTEMPT FLIGHT IF THERE IS NO INDICATION OF ALTERNATOR OUTPUT.

When the engine is firing evenly, advance the throttle to 800 RPM. If oil pressure is not indicated within thirty seconds, stop the engine and determine the trouble. In cold weather it will take a few seconds longer to get an oil pressure indication. If the engine has failed to start, refer to the "Lycoming Operating Handbook, Engine Troubles and Their Remedies."

Starter manufacturers recommend that cranking periods be limited to thirty seconds with a two minute rest between cranking periods. Longer cranking periods will shorten the life of the starter.

WARM-UP

As soon as the engine starts, the oil pressure should be checked. If no pressure is indicated within thirty seconds, stop the engine and determine the trouble. In cold weather it will take a few seconds longer to get an oil pressure indication. Warm-up the engine at 800 to 1200 RPM.

Take-off may be made as soon as ground check is completed, providing that the throttle may be opened fully without back firing or skipping, and without reduction in engine oil pressure.

GROUND CHECK

Check the magnetos at 1800 RPM by switching from Both to Right then back to Both before switching to Left. Differential drop should not exceed 50 RPM while the total drop on either magneto should not exceed 175 RPM.

Check vacuum gauge, indicator should read 5" Hg + 1" Hg at 2000 RPM.

Check both the oil temperature and pressure. The temperature may be low for some time if the engine is being run for the first time of the day, but as long as the pressure is within limits the engine is ready for takeoff.

Carburetor heat should also be checked prior to takeoff to be sure that the control is operating properly and to clear any ice which may have formed during taxiing. Avoid prolonged ground operation with carburetor heat ON as the air is unfiltered.

The electric fuel pump should be turned off momentarily during ground check to make sure that the engine driven pump is operating. The electric fuel pump should be on during takeoff to prevent loss of power should the engine driven pump fail. The engine is warm enough for takeoff when the throttle can be opened without the engine faltering.

Mixture should be set full rich, except a minimum amount of leaning is permitted for smooth engine operation when taking off at high elevation.

TAKE-OFF

Just before take-off the following items should be checked:

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|--------------------------|-------------------------------|
| 1. Fuel on proper tank | 6. Quadrant friction knob set |
| 2. Electric fuel pump ON | 7. Flaps set |
| 3. Engine gauges checked | 8. Trim tab set |
| 4. Carburetor heat OFF | 9. Controls free |
| 5. Mixture RICH | 10. Door latched |
| | 11. Fasten belts/harness |

In the conventional take-off procedure set the trim control slightly aft of neutral. Allow the airplane to accelerate to 50 to 60 miles per hour, then ease back on the wheel enough to let the airplane fly itself from the ground. Premature or excessive raising of the nose will result in a delayed take-off. After take-off let the aircraft accelerate to the desired climb speed by lowering the nose slightly.

Short Field, Obstacle Clearance:

Lower the flaps to 25° (second notch), accelerate to 55-60 miles per hour and ease back on the control wheel to rotate. After breaking ground, accelerate to the best angle of climb speed, 74 miles per hour. Slowly retract the flaps when the obstacle has been cleared and continue climb at 85 miles per hour.

Short Field, No Obstacles:

Lower the flaps to 25° (second notch) accelerate to 55-60 miles per hour. Ease back on the control wheel to rotate and accelerate to best rate of climb speed, 85 miles per hour. Slowly retract the flaps while climbing out.

Soft Field, No Obstacle:

Lower the flaps to 25° (second notch), accelerate aircraft and pull nose gear from the ground as soon as possible, lift off at lowest possible airspeed. Accelerate just above the ground to best rate of climb speed, 85 miles per hour. Climb out while slowly retracting the flaps.

Soft Field, Obstacle Clearance:

Lower flaps to 25° (second notch), accelerate aircraft, pull nose gear off as soon as possible and lift off at lowest possible airspeed. Accelerate just above the ground to best angle of climb speed, 74 miles per hour to climb past obstacle clearance height, continue climb while accelerating to best rate of climb speed, 85 miles per hour and slowly retract the flaps.

CLIMB

The best rate of climb airspeed at gross weight is 85 miles per hour while the best angle of climb airspeed is 74 miles per hour. At lighter than gross weight these speeds are reduced. The recommended enroute climbing speed of 100 miles per hour provides increased visibility over the nose. Shallow turns of a few degrees will also aid forward visibility during climb out.

STALLS

Stall characteristics of the Cherokee are conventional. Visual stall warning is provided by a red light located on the left side of the instrument panel which is turned on automatically between 5 and 10 miles per hour above stall speed. Gross weight stalling speed with power off and full flaps is 55 miles per hour at 2150 pounds. With flaps up this speed is increased 9 miles per hour.

Intentional spins are prohibited in the normal category airplane. Lazy eights and chandelles may be performed in the normal category provided a 60° angle of bank and/or a 30° angle of pitch is not exceeded. For approved maneuvers and entry speeds refer to the Flight Manual.

STALL SPEED TABLE

Angle of Bank	Flaps 40°	Flaps Retracted
0°	55 MPH	64 MPH
20°	57 MPH	66 MPH
40°	63 MPH	73 MPH
60°	78 MPH	91 MPH

Power Off – Gross Weight 2150 lbs.

Reduce the speed during the flareout and contact the ground close to the stalling speed (55 to 65 MPH). After ground contact hold the nose wheel off as long as possible. As the airplane slows down, drop the nose and apply the brakes. There will be less chance of skidding the tires if the flaps are retracted before applying the brakes. Braking is most effective when back pressure is applied to the control wheel, putting most of the aircraft weight on the main wheels. In high wind conditions, particularly in strong crosswinds, it may be desirable to approach the ground at higher than normal speeds with partial or no flaps.

STOPPING ENGINE

At the pilot's discretion, the flaps should be raised and the electric fuel pump turned off. After parking, the radios should be turned off and the engine stopped by pulling the mixture control to idle cut-off. The throttle should be left full aft to avoid engine vibration while stopping. When alternate fuels are used, the engine should be run up to 1200 RPM for one minute prior to shutdown to clean out any unburned fuel. Then the magneto and master switches should be turned off.

ENGINE POWER LOSS

The most common cause of engine power loss is mismanagement of the fuel. Therefore, the first step to take after engine power loss is to move the fuel selector valve to the tank not being used. This will often keep the engine running even if there is no apparent reason for the engine to stop on the tank being used.

MOORING

The Cherokee should be moved on the ground with the aid of the nose wheel tow bar provided with each plane and secured in the baggage compartment. Tie downs may be secured to rings provided under each wing, and to the tail skid. The aileron and stabilator control wheel shaft are secured by looping the seat belt through the control wheel and pulling it tight. The rudder is held in position by its connections to the nose wheel steering, and normally does not have to be secured. The flaps are locked when in the full up position, and should be left retracted.

WEIGHT AND BALANCE

It is the responsibility of the owner and pilot to determine that the airplane remains within the allowable weight vs. center of gravity envelope while in flight. For weight and balance data see the Airplane Flight Manual and Weight and Balance Form supplied with each airplane.

OPERATING TIPS

The following Operating Tips are of particular value in the operation of the Cherokee 140 "B".

1. Learn to trim for take-off so that only a very light back pressure on the wheel is required to lift the airplane off the ground.
2. The best speed for take-off is about 60 MPH under normal conditions. Trying to pull the airplane off the ground at too low an airspeed decreases the controllability of the airplane in event of engine failure.