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SECTION II

DESIGN INFORMATION

ENGINE AND PROPELLER

The Cherokee is powered by a Lycoming engine of either 150, 160 or 180 H.P. (Refer to Power Plant Specifications on Page 1) Each engine is furnished with a starter, 35 ampere 12 volt *generator or **alternator, voltage regulator, shielded ignition, vacuum pump drive, fuel pump and a dry, automotive type carburetor air filter.

The exhaust system is a stainless steel cross-over type. A large muffler with heater shroud is provided to supply heat for both the cabin and carburetor de-icing.

The propeller used is a Sensenich fixed pitch, all metal aluminum alloy. Refer to the Power Plant Specifications on Page 1 for the model of propeller used with each engine.

STRUCTURES

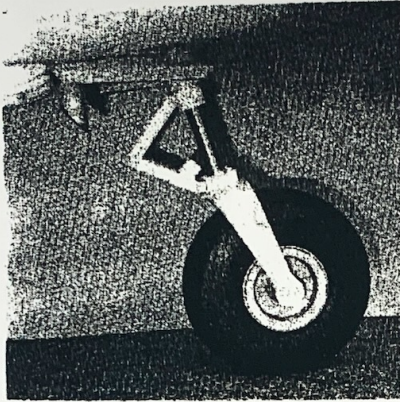
All structures are of aluminum alloy construction and are designed to ultimate load factors well in excess of normal requirements. All exterior surfaces are primed with etching primer and painted with acrylic enamel.

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, NACA 652-415 with the maximum thickness about 40% aft of the leading edge. This permits the main spar carrythrough structure to be located under the rear seat providing unobstructed cabin

*PA-28 Serial Nos. 28-1 to 28-507 inclusive

**PA-28 Serial Nos. 28-508 and up



floor space ahead of the rear seat.

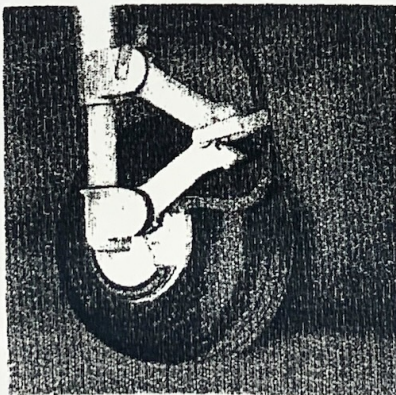
LANDING GEAR

The three landing gears use a Cleveland 600 x 6 wheel, the main wheels being provided with brake drums and Cleveland single disc hydraulic brake assemblies, No. 30-18. All wheels use 600 x 6 four ply tires with tubes.

The nose gear is steerable through a 30 degree 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 three struts are of the air-oil type, with the normal extension being 3-1/2 inches for the nose gear and 2 inches for the main gear.

The brakes are actuated by a hand lever and master cylinder, which is located below and behind the left center of the instrument sub-panel. The brake-fluid reservoir is installed on the top, left, front face of the firewall. The parking brake is incorporated in the master cylinder and is actuated by pulling back on the brake lever and depressing the knob attached to the left side of the handle. Then release the brake lever. To release the parking brake, pull back on the brake lever to disengage the catch mechanism. Then allow the handle to swing forward.



CONTROL SYSTEMS

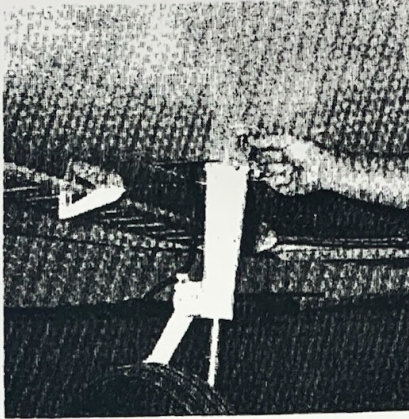
Dual controls are provided as standard equipment, with a cable system used between the controls and the surfaces. The horizontal tail is of the all movable slab type, with an anti-servo tab which also acts as a longitudinal trim tab, actuated by a control on the cabin ceiling. The stabilator provides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

The flaps are manually operated, balanced for light operating forces and spring loaded to return 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.

FUEL SYSTEM

Fuel is stored in two twenty-five gallon tanks which are secured to the leading edge structure of each wing by screws and nut plates. This allows easy removal for service or inspection.

The standard quantity of fuel is 36 gallons for the Cherokee 150 and 160 and 50 gallons for the Cherokee 180. To obtain the standard quantity of 36 gallon of fuel on the 150 and 160 fill the tanks only to the bottom of the filler necks, which extends some distance into the tanks. To fill to the standard plus

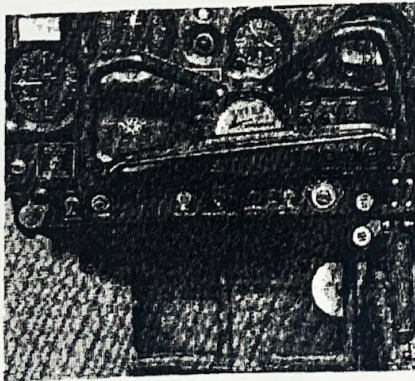


reserve quantity of 50 gallons the tanks are filled completely to the top. This system allows the fuel quantity to be varied conveniently according to the payload.

An auxiliary electric fuel pump is provided for use in case of failure of the engine driven pump. The electric pump should be on for all take-offs and landings.

The fuel strainer, which is equipped with a quick drain, is located on the front lower left corner of the firewall. This strainer should be drained regularly to check for water or sediment accumulation. To drain the lines from the tanks, the tank selector valve must be switched to each tank in turn, with the electric pump on, and the gascolator drain valve opened. Each tank has an individual quick drain located at the bottom, inboard, rear corner.

Fuel quantity and pressure are indicated on gauges located in the engine gauge cluster on the right side of the instrument panel.



ELECTRICAL SYSTEM

The electrical system includes a 12 volt *generator or **alternator, battery, voltage regulator and master switch relay. The battery, regulator and relay are mounted in the battery compartment immediately aft of the baggage compartment. Access for service or inspection is conveniently obtained through a removable

Electrical Switches

*Generator installed on PA-28, Serial Nos. 28-1 to 28-507 inclusive
 **Alternator installed on PA-28, Serial Nos. 28-508 and up

panel at lower right corner of the compartment.

Electrical switches, fuses and fuse spares are located on the lower left center of the instrument panel, and the left side of the instrument sub-panel.

Standard electrical accessories include: Starter, Electric Fuel Pump, Fuel Gauge, Stall Warning Indicator, Cigar Lighter and Ammeter.

Navigation Lights, Anti-Collision Light, Landing Light, Instrument Lighting and the Cabin Dome Light are offered as optional accessories.

Circuit provisions are made to handle optional communications and navigational equipment.

Installed on late model Cherokees (Serial Nos. 28-508 and up) is the Piper F.T.P. (Full Time Power) Electrical System.

Derived from this system are many advantages both in operation and maintenance. The main advantage is, of course, full electrical power output regardless of engine R.P.M. This is a great improvement for radio and electrical equipment operation. Also because of the availability of generator output at all times, the battery will be charging for a greater percentage of use, which will greatly improve cold-morning starting.

Unlike previous generator systems, the ammeter does not indicate battery discharge, rather it displays the load in amperes placed on the system. With all electrical equipment off (except master switch) the ammeter will be indicating the amount of charging current demanded by the battery. This amount will vary, depending on the percentage of full charge in the battery at the time. As the battery becomes charged, the amount of current displayed on the ammeter will reduce to about two amperes. When each piece of electrical equipment is switched on, the currents will add up and the total, including the battery, will appear on the ammeter. The maximum continuous load for night flight, with radios on, is about 30 amperes. This 30-ampere value, plus approximately two amperes for a fully charged battery, will appear continuously under these flight conditions.

The amount of current shown on the ammeter will tell immediately whether or not the generator system is operating normally as this amount of current shown should equal the total amount of amperes being drawn by the equipment which is operating.

Maintenance on the alternator will prove to be a minor factor. Should service be required, contact the local Piper Dealer.

HEATING AND VENTILATING SYSTEM

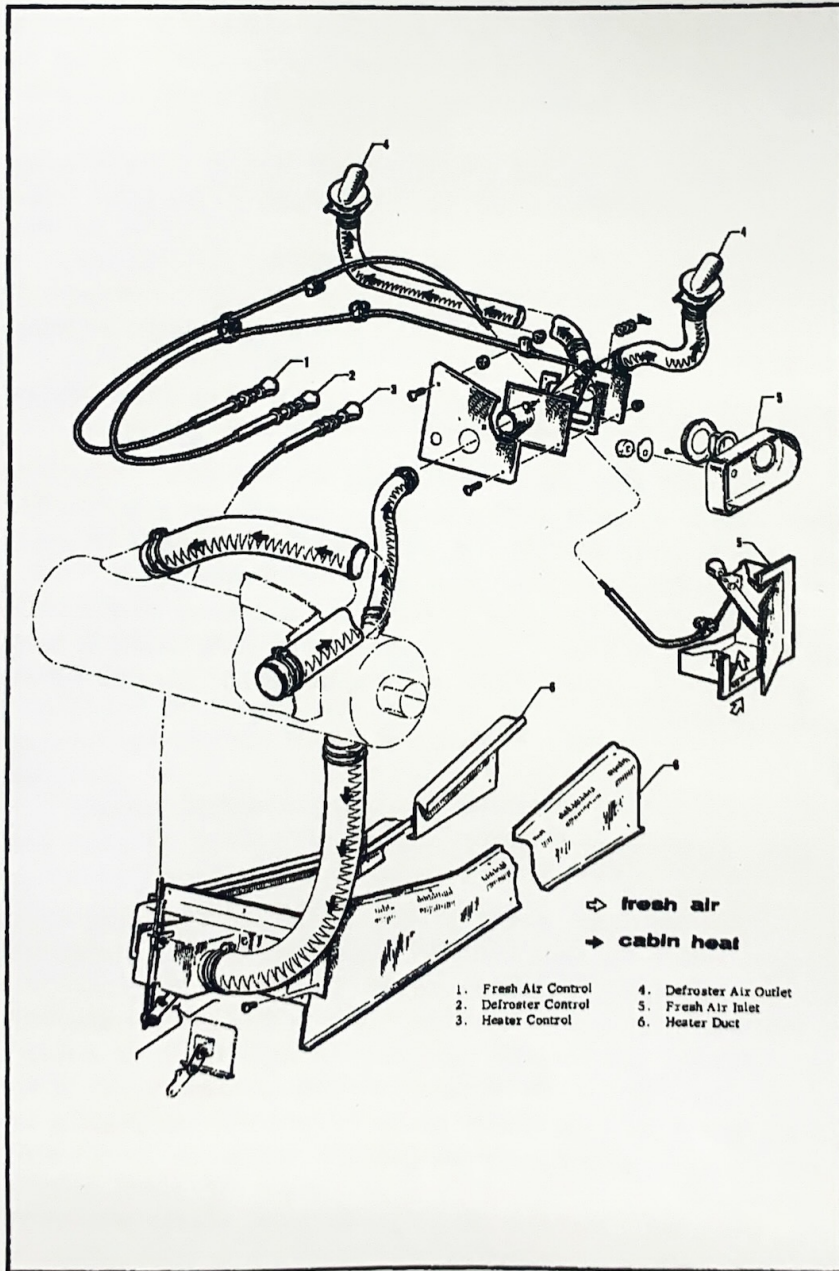
Heat for the cabin interior and the defroster system is provided by a heater muff attached to the exhaust system. The amount of heat desired can be regulated with the controls located on the lower right side of the instrument panel.

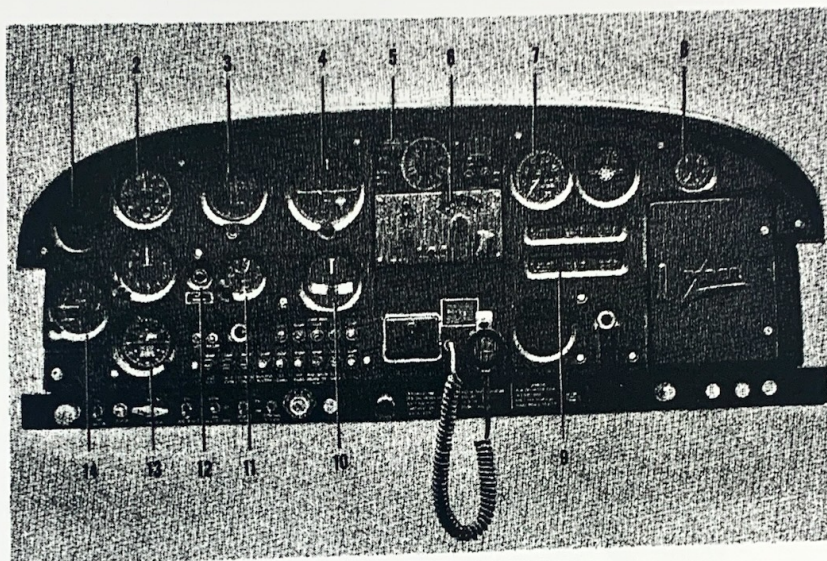
A control is provided to regulate the amount of fresh air to the cabin interior. Also provided are side vents at each seat location. These vents are regulated as desired by the seat occupant.

CABIN FEATURES

The instrument panel of the Cherokee is designed to accommodate the customary advanced flight instruments and all the normally required power plant instruments. The Artificial Horizon, Directional Gyro and the Turn and Bank instruments are vacuum operated through use of a vacuum pump installed on the engine. A natural separation of the flight group and the power group is provided by placing the communications and radio navigational equipment in the center of the panel.

The front seats are adjustable fore and aft for pilot comfort and ease of entry and exit.





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| 1. Compass | 8. Vacuum Gauge |
| 2. Airspeed Indicator | 9. Instrument Cluster |
| 3. Directional Gyro Indicator | 10. Turn and Bank Indicator |
| 4. Gyro Horizon Indicator | 11. Clock |
| 5. AutoNav Radio | 12. Stall Warning Light |
| 6. Piper PTR-I Radio | 13. Omni Indicator |
| 7. Tachometer | 14. Rate of Climb Indicator |