FUEL INJECTION

The Bendix RSA-5 fuel injection system is based on the principle of measuring engine air consumption by use of a venturi tube and using airflow to control fuel flow to the engines. Fuel distribution to the cylinders is accomplished by a fuel flow divider.

Fuel pressure regulation by means of the servo valve causes a minimal drop in fuel pressure throughout the metering system. Metering pressure is maintained above vapor forming conditions while fuel inlet pressure is low enough to allow the use of a diaphragm pump. Vapor lock and associated problems of difficult starting are thus eliminated.

Incorporated in the servo regulator is the airflow sensing system which contains a throttle valve and venturi. The differential pressure between the entrance and the throat of the venturi is the measurement of air entering the engine. These pressures are applied across an air diaphragm in the regulator. A change in power changes the airflow to the engine and across the diaphragm in the regulator.

Mounted on top of the engine is the ported fuel flow divider with four nozzle lines routed to the cylinders. The divider contains a spring loaded positive shut-off valve. Within each cylinder are continuous flow air bleed nozzles with provisions to eliminate the adverse effects of low manifold pressure when idling. Since fuel metering is provided by the servo regulator rather than the nozzles, more uniform cylinder head temperatures result and a longer engine life is possible.

Induction air for the engine enters the opening in the nose cowl and is picked up by a large air duct at the right rear baffle. The air is directed through a filter and on to the servo regulator. An alternate air source for the induction system contains a spring loaded door at the throat of the servo regulator. This door operates automatically if primary source is obstructed or manually by the push-pull control on the right side of the power control quadrant. The primary system should always be used for take-off.

STRUCTURES

Structures are of sheet aluminum construction and are designed to ultimate load factors well in excess of normal requirements. All components are completely zinc chromate primed and exterior surfaces are coated with acrylic lacquer.

The main spars of the wings are joined with high strength butt fittings in the center of the fuselage, making in effect a continuous main spar. The spars are attached to the fuselage at the side of the fuselage and in the center of the structure; wings are also attached at the rear spar and at an auxiliary front spar.

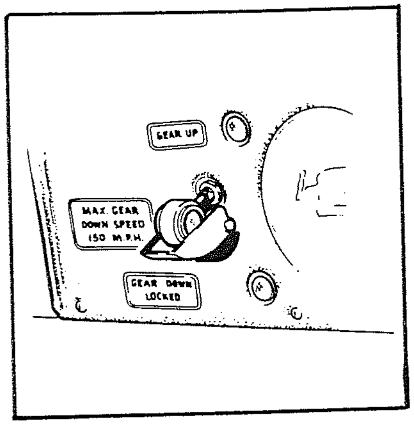
The wing airfoil section is a laminar flow type, NACA-64_2A215, with maximum thickness about 40% aft of the leading edge. This permits the main spar, located at the point of maximum thickness, to pass through the cabin under the rear seat, providing unobstructed cabin floor space ahead of the seat.

LANDING GEAR

The nose gear is steerable with the rudder pedals through a 40 degree arc. During retraction of the gear, the steering mechanism is disconnected automatically to reduce rudder pedal loads in flight. The nose gear is equipped with a hydraulic shimmy dampener.

Retraction of the landing gear is accomplished through the use of an electric motor and gear train, actuating push-pull cables to each of the main gear and a tube to the nose gear. The landing gear motor is beneath the center floor panel and the selector switch on the instrument panel to the left of the power control quadrant.

To guard against inadvertent movement of the landing gear selector on the ground, the handle must also be pulled aft before moving it upward. The gear selector has the shape of a wheel to



Gear Selector Switch

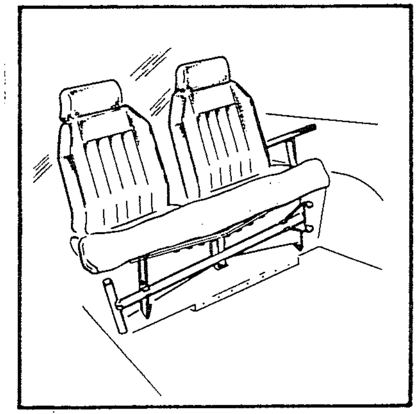
distinguish it from the electric flap control which has an airfoil shape. As an added safety feature, the warning horn is connected to the gear selector switch. The horn will then operate if the selector is moved to the UP position with the master switch on and the weight of the airplane on the landing gear. To prevent gear retraction on the ground, an anti-retraction switch is installed on the left main gear. This prevents the completion of the electric circuit to the landing gear motor until the gear strut is within 3/4 inch of full extension.

The gear indicating lights are located conveniently above and below the gear selector switch. The green indicating light (located below the selector switch) shows that all gears are down and locked. The amber light (located above the gear selector switch) is the gear up indication. The amber light will flash when power is reduced on one engine and the gear is up. The warning horn will operate when power is reduced (below approximately 12" of manifold pressure) on both engines and the gear is not down and locked. The pilot should become familiar with the gear warning horn to distinguish it from the stall warning horn. GEAR INDICATION LIGHTS ARE AUTOMATICALLY DIMMED WHEN THE INSTRUMENT LIGHTS ARE TURNED ON.

The brakes are actuated by toe brake pedals mounted on the left set of the rudder pedals. Hydraulic brake cylinders above the brake pedals are accessible in the cockpit for servicing. Parking brake valves are incorporated in each cylinder and have two cables attached from the parking brake "T" handle. To prevent inadvertent application of the parking brake in flight, a safety lock is incorporated in the valves, thus eliminating the possibility of pulling out the "T" handle until pressure is applied by use of the toe brakes. Toe brakes for the right side are available as optional equipment.

A tow bar is provided with each aircraft. When not in use it is stowed next to the main spar. It may be removed by lifting the flap covering the forward side of the spar and removing the bar from its fasteners.

When towing with power equipment, caution should be used not to turn the nose gear beyond its 40 degree arc as this may cause damage to the nose gear and steering mechanism.



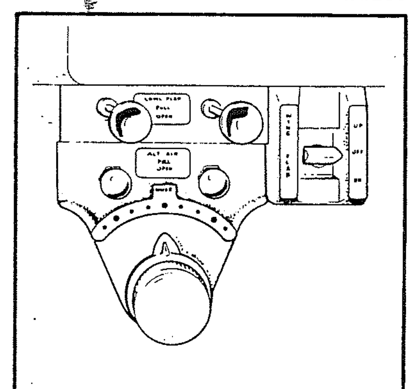
Tow Bar Stowage

CONTROL SYSTEM

Dual flight controls are provided as standard equipment. Cables connect the movable control surfaces with the rudder pedals and control columns.

Directional and longitudinal trim is provided by an adjustable trim mechanism for the rudder and stabilator. The manual rudder trim control is located to the right of the throttle quadrant.

Max-Lift electrically operated flaps are used on the Twin Comanche. The flaps are operated by an electric motor; they can be lowered



Rudder Trim and Flap Controls