

FLIGHT CONTROLS SYSTEM

The flight controls consist of the ailerons, elevators and rudder and their respective trim systems. All of these surfaces are statically mass balanced.

AILERON SYSTEM

Each aileron, see Figure 7-4, is attached to the rear main wing spar at two points. The aileron is actuated by a yoke assembly which is attached to a wheel in the wing. The wheel is actuated by cables attached to the pilot's control wheel. The aileron system is interconnected with the rudder system through a spring assembly.

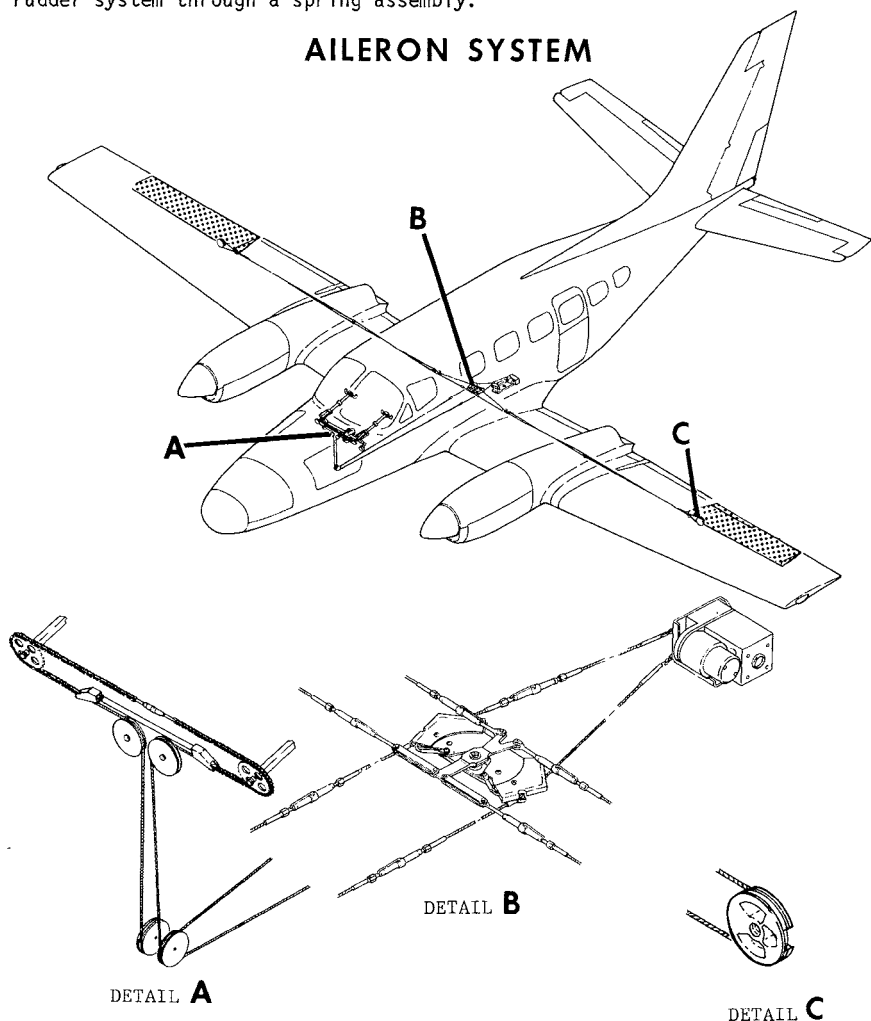


Figure 7-4

AILERON TRIM SYSTEM

Aileron trim, see Figure 7-5, is achieved by a trim tab attached to the left aileron with a full length piano-type hinge. The trim tab is actuated by a push-pull rod which is attached to a jack screw type actuator in the wing. The actuator is driven by cables attached to the trim control knob on the cockpit control pedestal.

AILERON TRIM SYSTEM

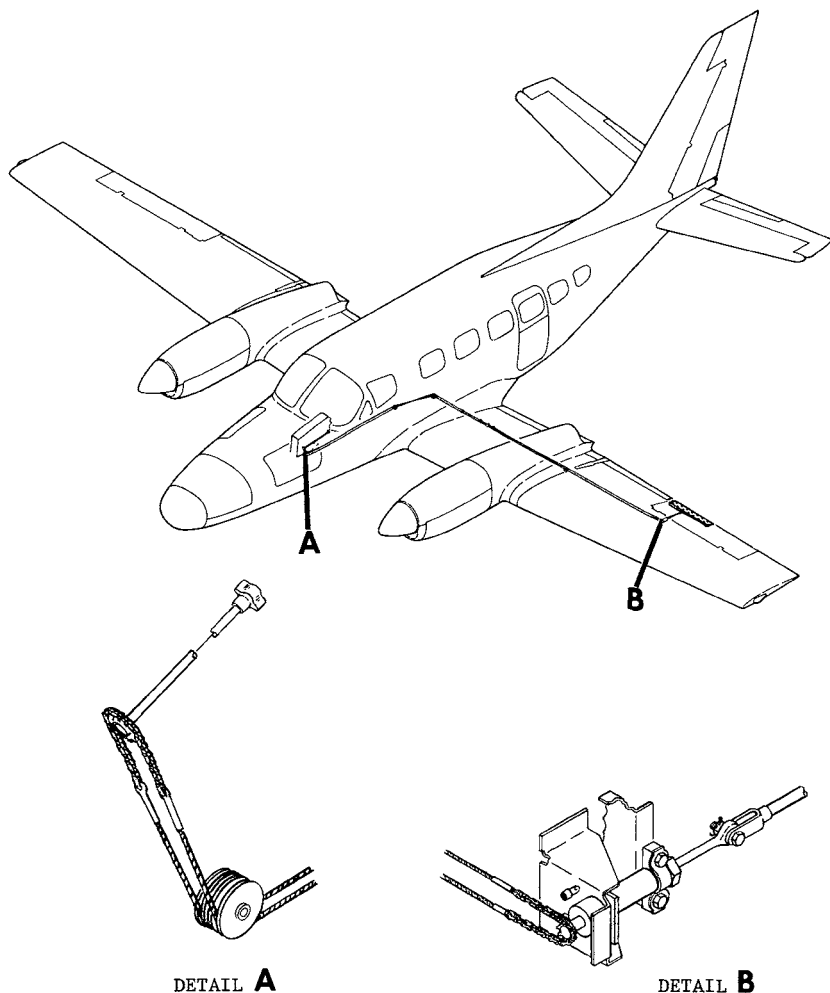


Figure 7-5

ELEVATOR SYSTEM

The two elevator control surfaces, see Figure 7-6, are connected by a torque tube. The resulting elevator assembly is attached to the rear spar of the horizontal stabilizer at six points. The elevator assembly is actuated by a push-pull rod which is attached to a bell crank in the empennage. The bell crank is actuated by cables attached to the pilot's control wheel.

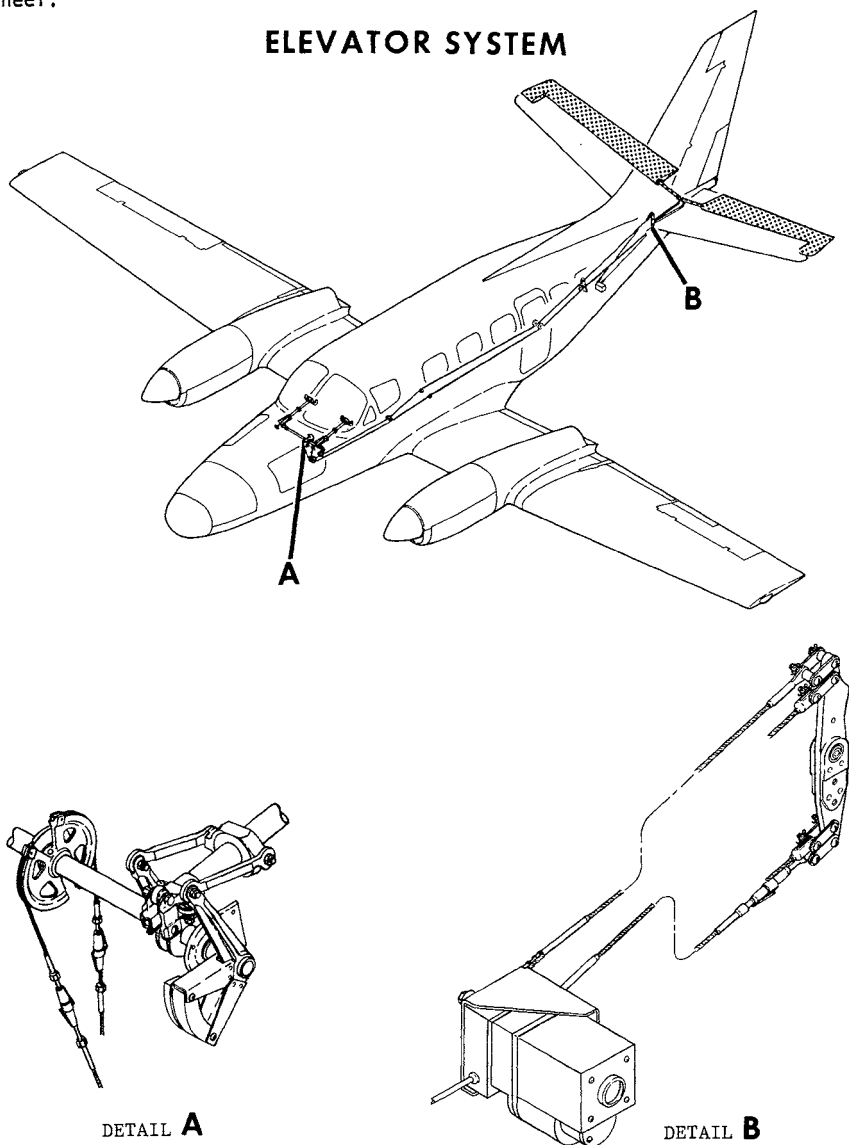
ELEVATOR SYSTEM

Figure 7-6

ELEVATOR TRIM SYSTEM

Elevator trim, see Figure 7-7, is achieved by an elevator trim tab attached to the right and left elevators with a full length piano-type hinge. The trim tabs are actuated by push-pull rods which are attached to dual jack screw type actuators in the horizontal stabilizer. The actuators are driven by cables attached to the trim control wheel on the cockpit control pedestal.

ELEVATOR TRIM SYSTEM

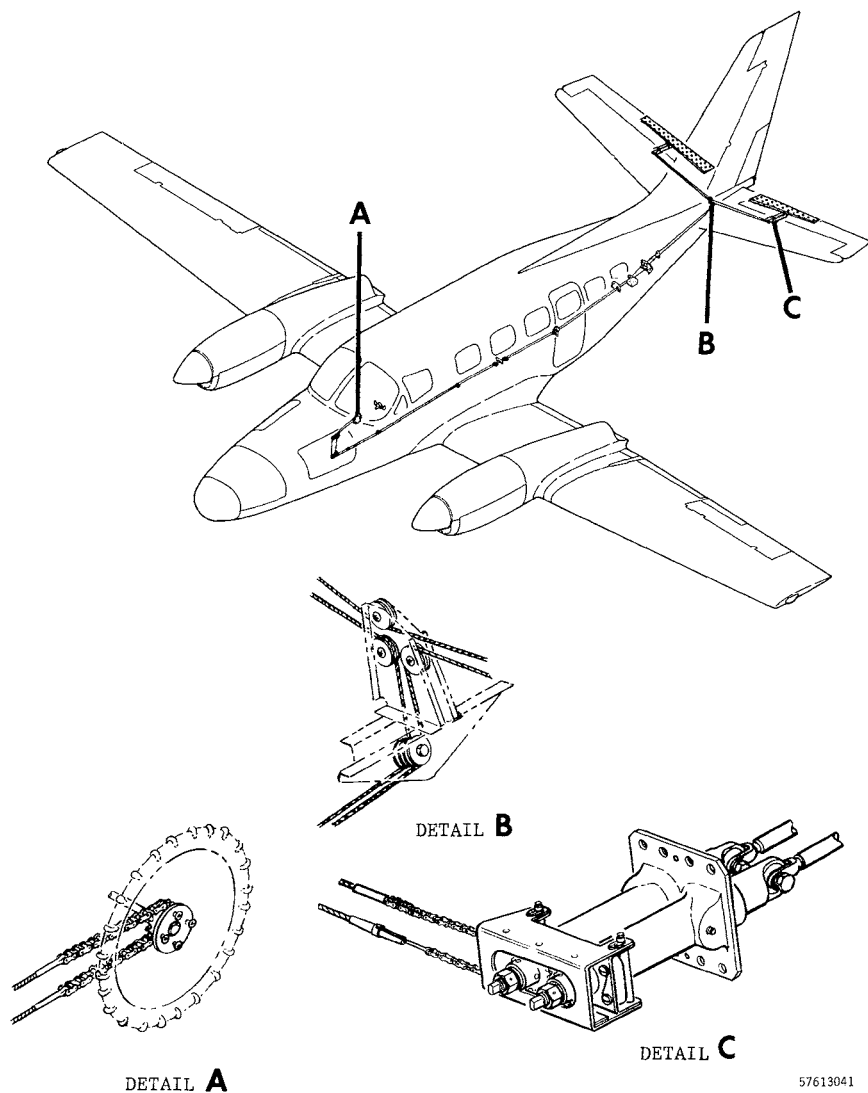


Figure 7-7

RUDDER SYSTEM

The rudder, see Figure 7-8, is attached to the vertical stabilizer rear main spar at three points. The rudder is actuated by a bell crank attached to the bottom of the rudder. The bell crank is actuated by cables attached to the cockpit rudder pedals. The rudder system is interconnected with the aileron system through a spring assembly.

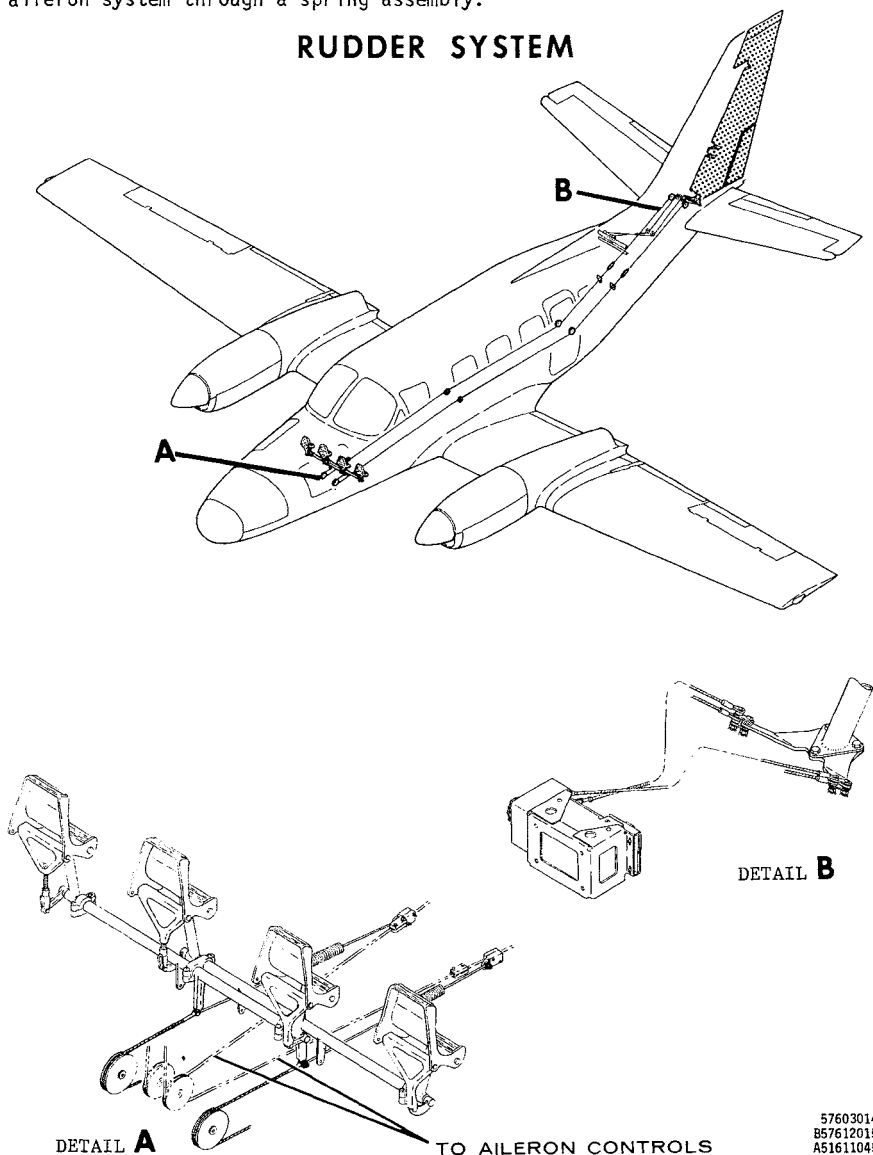
RUDDER SYSTEM

Figure 7-8

RUDDER TRIM SYSTEM

Rudder trim, see Figure 7-9, is achieved by a trim tab attached to the lower half of the rudder with a full length piano-type hinge. The trim tab is actuated by a push-pull rod which is attached to a jack screw type actuator in the vertical stabilizer. The actuator is driven by cables attached to the rudder trim wheel on the cockpit control pedestal. The rudder trim tab also acts as a servo tab so that aerodynamic forces on the tab will move the rudder to the selected position, which reduces the forces required to activate the rudder in flight.

RUDDER TRIM SYSTEM

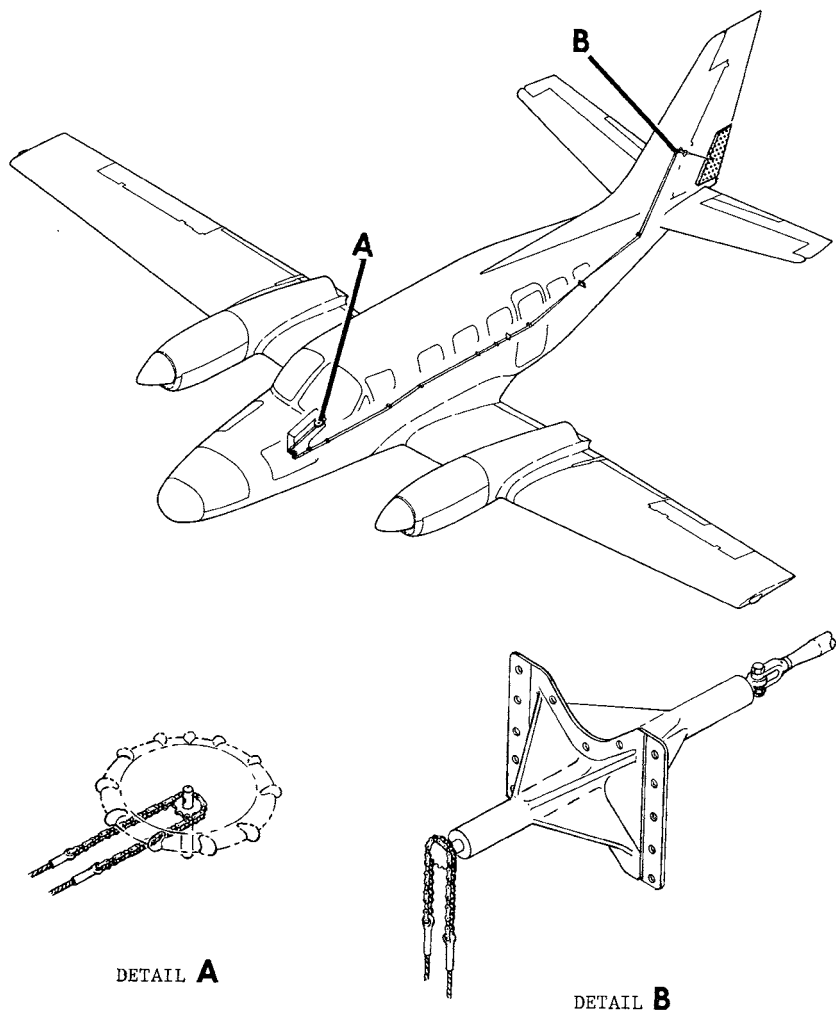


Figure 7-9

MINIMUM TURNING DISTANCE

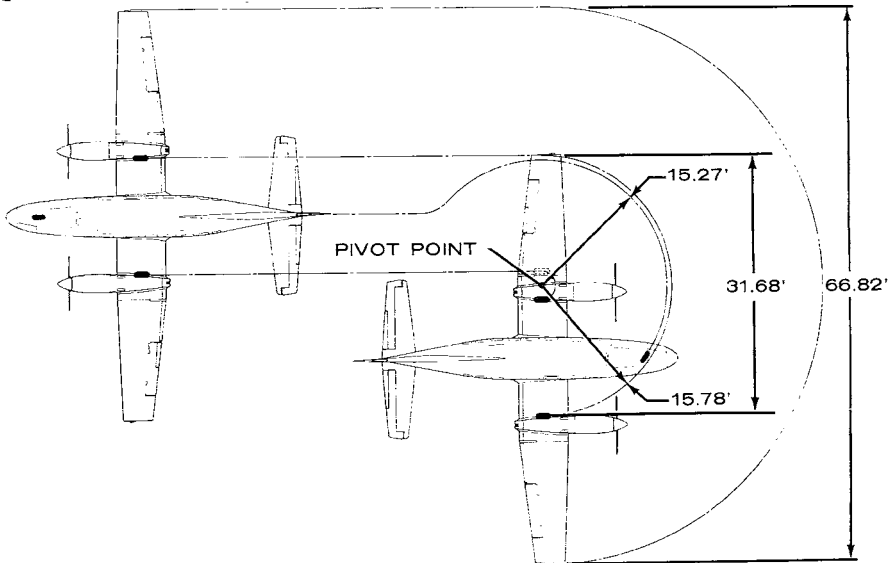


Figure 7-11

WING FLAPS SYSTEM

The wing flaps, see Figure 7-12, are the extensible Fowler type. Each wing flap (two per side) is mounted on tracks which are attached to the wing rear spar. The wing flap sections are actuated by push-pull rods attached to bell cranks in the wing. The bell cranks in each wing are interconnected with push-pull rods. Each inboard push-pull rod is attached to the center bell crank which is actuated by a hydraulic flap actuator.

The hydraulically operated flap actuator is controlled by the wing flap position switch, see Figure 7-1. This switch incorporates a preselect feature which allows the pilot to select the amount of flap extension desired. With the wing flaps set at the UP, T.O., APPR or LAND positions, the corresponding inboard wing flap extensions are 0°, 10°, 20° and 30°. The outboard wing flaps are mechanically linked to the inboard sections, extending at a slower rate. When the inboard wing flaps are fully extended (30°), the outboard wing flaps are extended 20°.

Selecting the UP, T.O., APPR or LAND position on the wing flap selector switch causes the hydraulically operated flap actuator to drive the flaps toward the selected position. When the actual flap position equals the selected position, limit switches will electrically actuate the flap control valve which stops the flow of hydraulic fluid to the hydraulic flap actuator. The wing flaps will complete the extension cycle in approximately 15 seconds with both engines operating.

Each engine's hydraulic pump supplies hydraulic pressure to actuate the wing flaps. The HYD PRESS ON indicator lights, see Figure 7-3, will remain on until the wing flaps reach their selected position. The hydraulic reservoir, located in the inboard left wing, incorporates a sight gage for checking the fluid level. The sight gage, incorporated into the reservoir

filler cap is flush with the upper wing skin and should be checked during the preflight inspection. If the sight gage is dark in color, the reservoir does not require servicing. If the sight gage is clear, service the reservoir before flight. On airplane serials 441-0001 thru 441-0116, reservoir pressure will automatically relieve when the cap is opened. On airplane serials 441-0117 thru 441-0172, a pressure relief valve is provided on the lower surface of the wing to allow system pressure to be relieved before removing the reservoir cap.

WING FLAPS SYSTEM

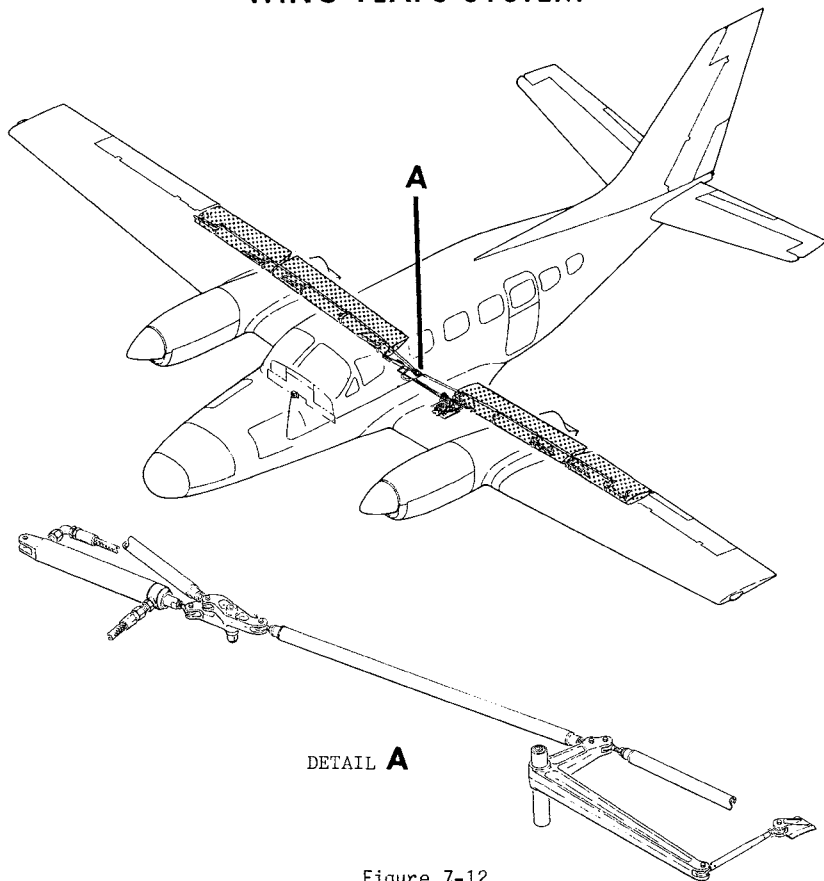


Figure 7-12

LANDING GEAR SYSTEM

The retractable tricycle landing gear, see Figure 7-13, is electrically controlled and hydraulically actuated. The individual landing gear actuators incorporate an internal lock to hold the landing gear in the extended position. The landing gear is held in the retracted position by mechanical uplocks that are released hydraulically during gear extension. The landing gear completes the retraction cycle in approximately 5.0 seconds with both engines operating.