Flight Controls

The SR22 uses conventional flight controls for ailerons, elevator and rudder. The control surfaces are pilot controlled through either of two single-handed side control yokes mounted beneath the instrument panel. The location and design of the control yokes allow easy, natural use by the pilot. The control system uses a combination of push rods, cables and bell cranks for control of the surfaces.

Roll trim and pitch trim are available through an electric button on the top of each control yoke. Electric yaw trim, if installed, is accomplished by operating a switch on the forward console immediately to the left of the Flaps switch.

Elevator System

The two-piece elevator provides airplane pitch control. The elevator is of conventional design with skin, spar and ribs manufactured of aluminum. Each elevator half is attached to the horizontal stabilizer at two hinge points and to the fuselage tailcone at the elevator control sector.

Elevator motion is generated through the pilot's control yokes by sliding the yoke tubes forward or aft in a bearing carriage. A push-pull linkage is connected to a cable sector mounted on a torque tube. A single cable system runs from the forward elevator sector under the cabin floor to the aft elevator sector pulley. A push-pull tube connected to the aft elevator sector pulley transmits motion to the elevator bellcrank attached to the elevators.

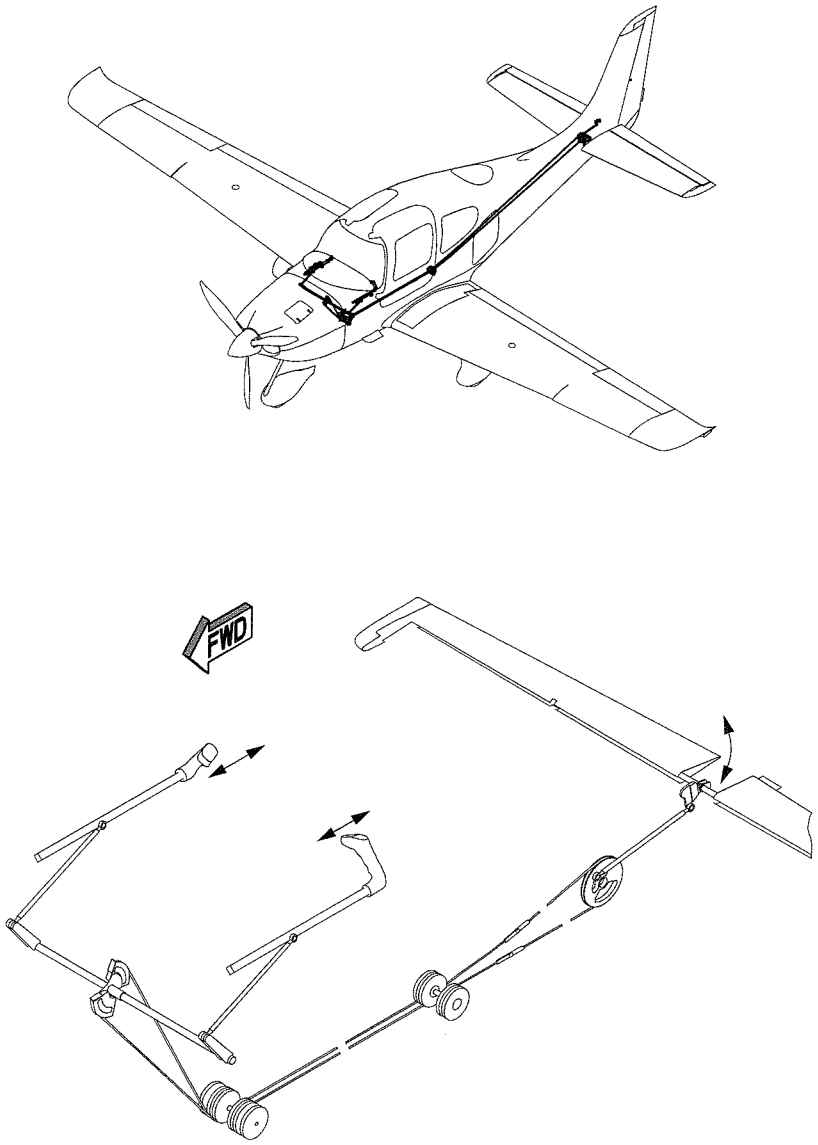
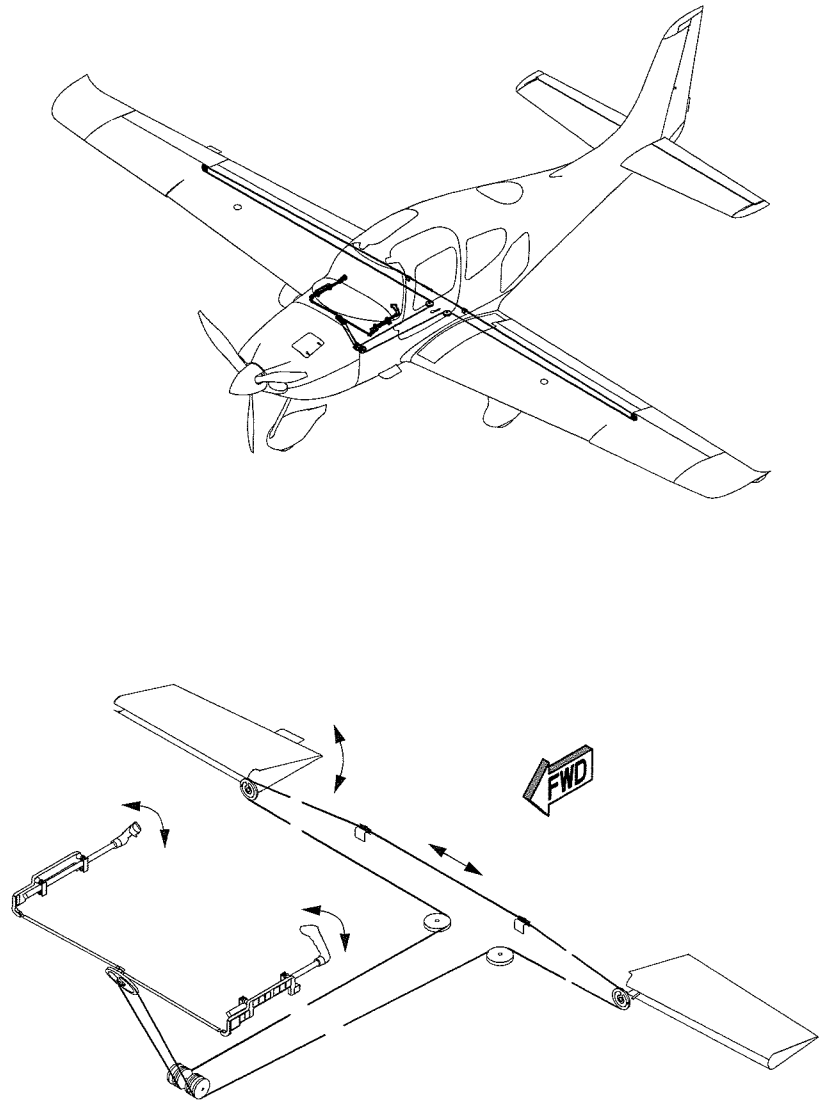


Figure 7-1
Elevator Control System

Aileron System

The ailerons provide airplane roll control. The ailerons are of conventional design with skin, spar and ribs manufactured of aluminum. Each aileron is attached to the wing shear web at two hinge points.

Aileron control motion is generated through the pilot's control yokes by rotating the yokes in pivoting bearing carriages. Push rods link the pivoting carriages to a centrally located pulley sector. A single cable system runs from the sector to beneath the cabin floor and aft of the rear spar. From there, the cables are routed in each wing to a vertical sector/crank arm that rotates the aileron through a right angle conical drive arm.



SR22_FM07_1462

Figure 7-2
Aileron Control System

Rudder System

The rudder provides airplane directional (yaw) control. The rudder is of conventional design with skin, spar and ribs manufactured of aluminum. The rudder is attached to the aft vertical stabilizer shear web at three hinge points and to the fuselage tailcone at the rudder control bell crank.

Rudder motion is transferred from the rudder pedals to the rudder by a single cable system under the cabin floor to a sector next to the elevator sector pulley in the aft fuselage. A push-pull tube from the sector to the rudder bell crank translates cable motion to the rudder. Springs and a ground adjustable spring cartridge connected to the rudder pedal assembly tension the cables and provide centering force.

A rudder-aileron interconnect is installed to provide a maximum of 5° down aileron with full rudder deflection. Right rudder input will cause right roll input and left rudder input will cause left roll input. With neutral aileron trim, aileron inputs will not cause rudder deflection.

On some airplanes, an electrically operated trim tab on the trailing edge of the rudder allows pilot-operated rudder trim. Airplanes without electric rudder trim have a ground adjustable trim tab installed.

Control Locks

The Cirrus SR22 control system is not equipped with gust locks. The trim spring cartridges have sufficient power to act as a gust damper without rigidly locking the position.

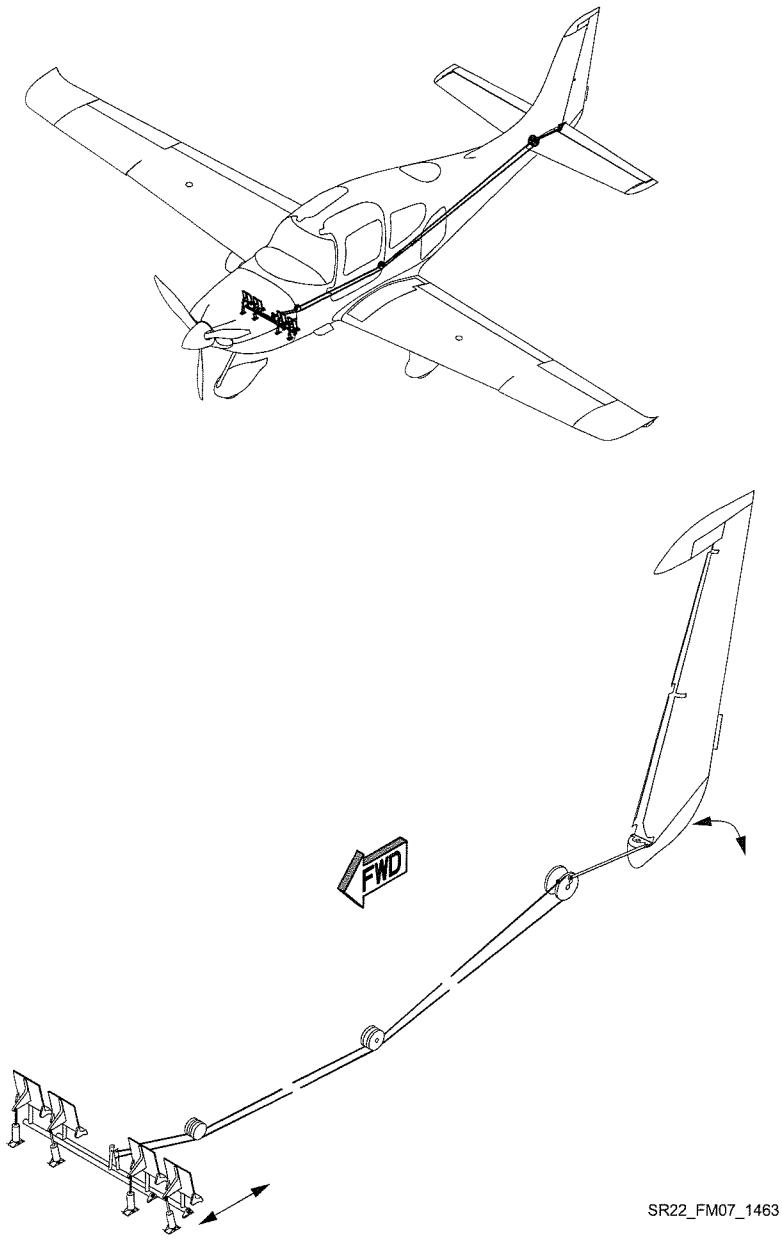


Figure 7-3
Rudder Control System

Trim Systems

Roll and pitch trim are provided by adjusting the neutral position of a compression spring cartridge in each control system by means of an electric motor. The electric roll trim is also used by the autopilot to position the ailerons. An electrically actuated trim tab on the rudder, if installed, provides rudder trim. It is possible to easily override full trim or autopilot inputs by using normal control inputs.

Ground adjustable trim tabs are installed on the elevator and right aileron to provide small adjustments in neutral trim. On airplanes without electric rudder trim, a ground adjustable trim tab is installed on the rudder. These tabs are factory set and do not normally require adjustment.

Pitch Trim Control System

An electric motor changes the neutral position of the spring cartridge attached to the elevator control horn. A conical trim button located on top of each control yoke controls the motor. Moving the switch forward will initiate nose-down trim and moving the switch aft will initiate nose-up trim. Neutral (takeoff) trim is indicated by the alignment of a reference mark on the yoke tube with a tab attached to the instrument panel bolster. The elevator trim also provides a secondary means of aircraft pitch control in the event of a failure in the primary pitch control system not involving a jammed elevator. Elevator (pitch) trim operates on 28 VDC supplied through the 2-amp PITCH / YAW TRIM circuit breaker on Main Bus 1.

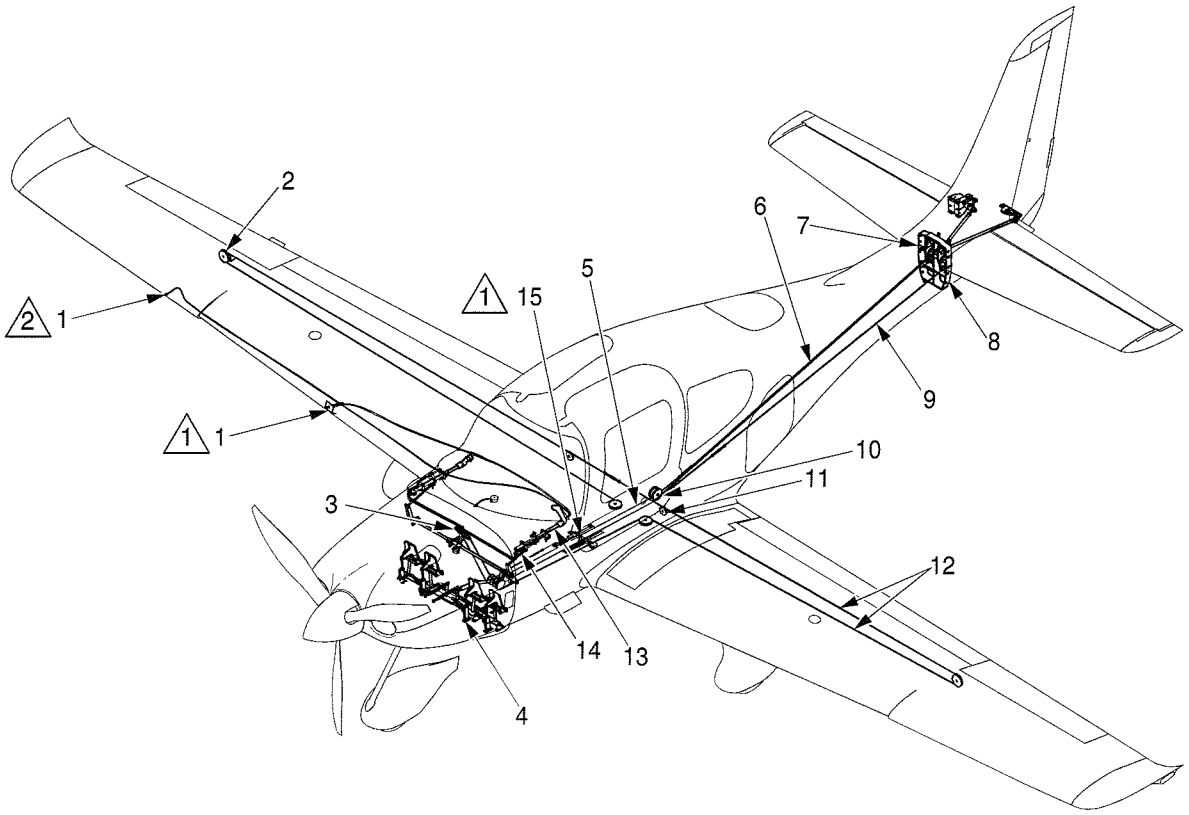
Roll Trim Control System

An electric motor changes the neutral position of a spring cartridge attached to the left actuation pulley in the wing. A conical trim button located on top of each control yoke controls the motor. Moving the switch left will initiate left-wing-down trim and moving the switch right will initiate right-wing-down trim. Neutral trim is indicated by the alignment of the line etched on the control yoke with the centering indication marked on the instrument panel. The aileron trim also provides a secondary means of aircraft roll control in the event of a failure in the primary roll control system not involving jammed ailerons. Aileron trim operates on 28 VDC supplied through the 2-amp ROLL TRIM circuit breaker on Main Bus 1.

Yaw Trim System

Yaw trim is provided by spring cartridge attached to the rudder pedal torque tube and console structure. The spring cartridge provides a centering force regardless of the direction of rudder deflection. The yaw trim is ground adjustable only.

On airplanes with electric rudder (yaw) trim, trim changes are pilot controlled through a linear actuator connected to a hinged trim tab on the rudder trailing edge. The actuator is installed in the rudder. A RUDDER TRIM indicator with integral rocker switch is mounted in the console immediately adjacent to the FLAP control switch. Pressing the left half of the switch initiates Nose L trim and pressing the right half initiates Nose R trim. A needle sweeps the trim indicator scale to indicate trim position. The full Nose Right trim tic is labeled TAKEOFF. Rudder (yaw) trim operates on 28 VDC supplied through the 2-amp PITCH / YAW TRIM circuit breaker on Main Bus 1. The switch and indicator are not internally illuminated.



LEGEND

1. Stall Warning System (27-31)
2. Roll Trim System (27-10)
3. Elevator System Cables (27-30)
4. Rudder Pedal Assembly (27-20)
5. Flap System (27-50)
6. Elevator System Cables (27-30)
7. Empennage Flight Controls (27-20)
8. Pitch Trim System (27-30)
9. Rudder System Cables (27-20)
10. Rudder/Elevator Pulley Gang (27-20)
11. Aileron System Pulleys (27-10)
12. Aileron System Cables (27-10)
13. Yoke Grip Assembly (27-10)
14. Yoke Assembly (27-10)
15. Rudder/Aileron Interconnect System (27-20)

NOTE

1 *Serials 0002 thru 2333, 2335 thru 2419, 2421 thru 2437.*

2 *Serials 2334, 2420, 2438 & subs.*

SR22_MM27_1356B

Figure 27-001
Flight Controls

AILERON AND ROLL TRIM SYSTEM

1. DESCRIPTION

This section describes that portion of the flight control system which controls the position and movement of the ailerons. Included are; aileron system rigging, control grip assembly, control yoke assembly, V-grooved guide wheel, pulleys and cables, roll trim cartridge, and 4-way trim/autopilot disconnect switch.

Aileron control motion is transferred by the control yoke through a linkage to a pulley mounted on the console structure. From the pulley, control motion is passed to a single cable system and is routed through the forward pulley gang at the bottom of the center console, under the cabin floor to the rudder-aileron interconnect (*Serials 0002 thru 2437*), and along the fuselage longerons to kick-out pulleys which direct the cables to the wing area between the aft spar and flap cove. The cables pass through fairleads at each flap hinge location where they attach to the aileron actuation pulley. As the aileron actuation pulley rotates, the control surface is deflected via a right-angle drive arm. A cross-over cable returns to the other wing, interconnecting the left and right ailerons. Cable retainers on each set of pulleys prevent fouling. Adjustable control stops on each aileron actuation pulley limit control surface travel.

The roll trim system acts as autopilot servo through the use of a captured compression spring cartridge integrated into the control system and activated by an electric motor. The spring cartridge, bolted directly to the LH aileron actuation pulley, and the electric trim motor, provide a centering force regardless of the direction of control surface deflection. When activated, the trim motor moves the spring cartridge causing the aileron actuation pulley to move the aileron to a new trimmed position. A 4-way switch, mounted on both yoke grips, controls the roll trim system.

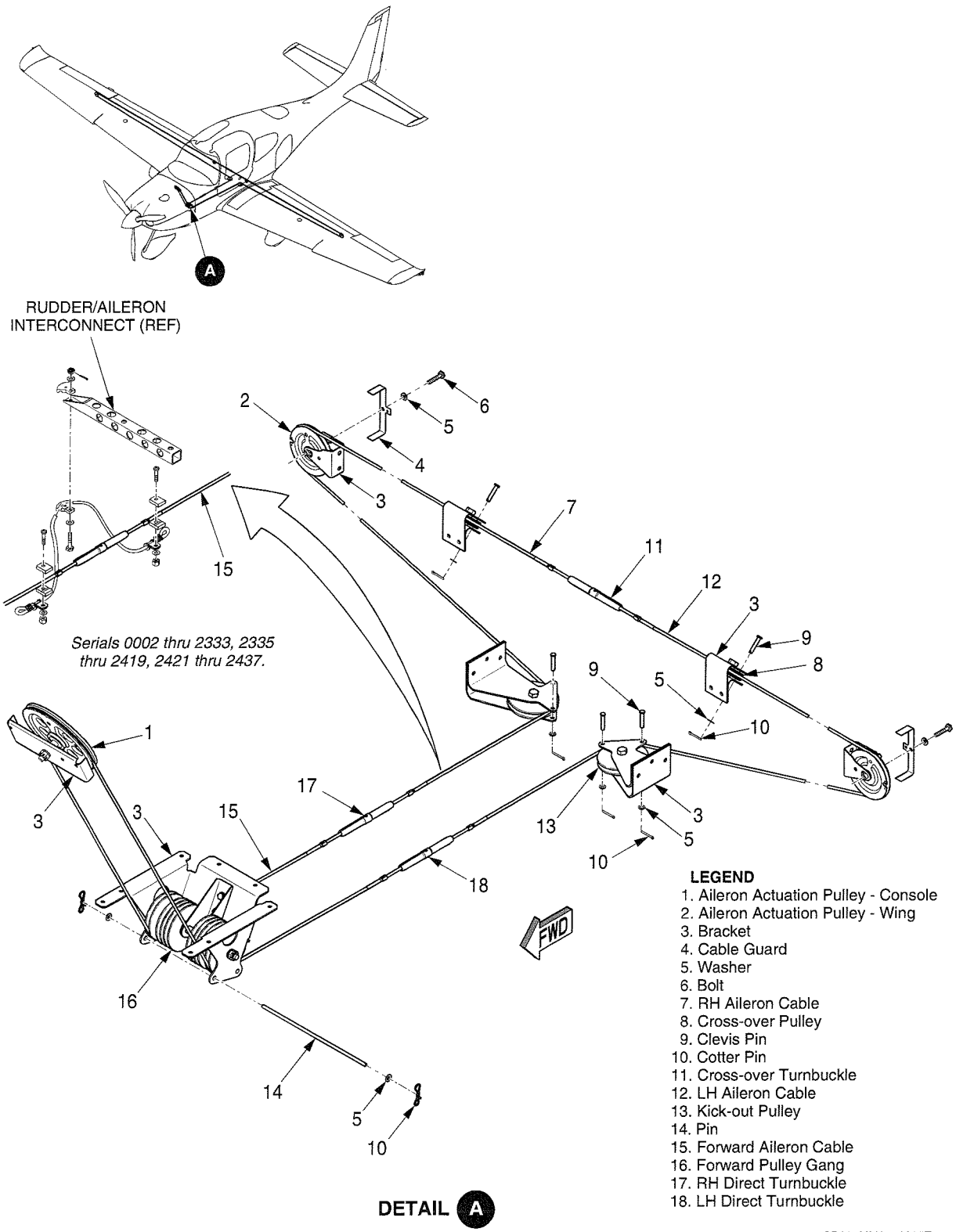


Figure 27-101
Aileron System Cables

ELEVATOR AND PITCH TRIM SYSTEM

1. DESCRIPTION

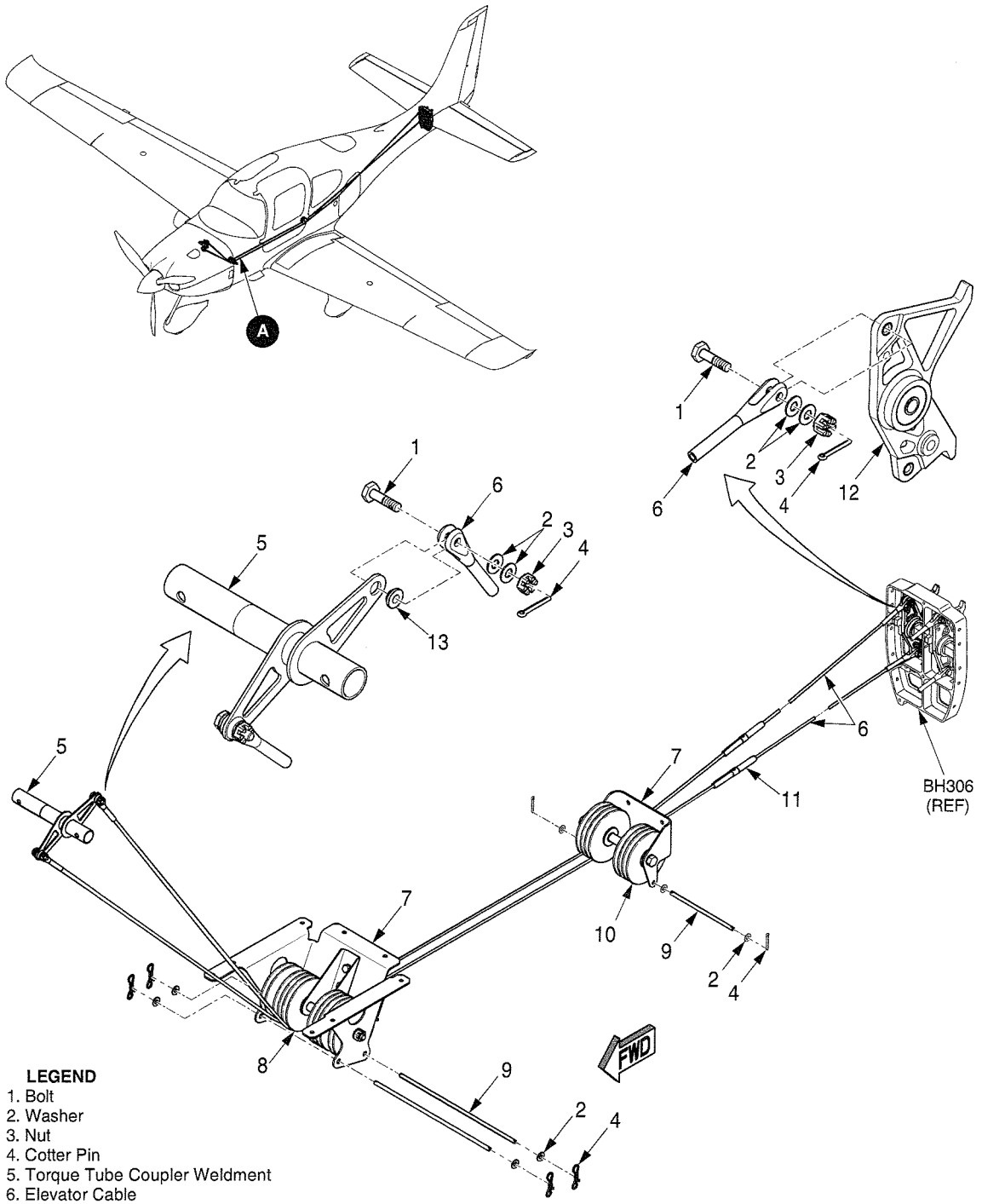
This section describes that portion of the flight control system which controls the position and movement of the elevator. Included are; elevator system torque tube, rigging, push/pull rods, pulleys, and pitch trim cartridge.

Serials 0002 thru 0497: Elevator control motion is transferred by the control yoke through a linkage to a pulley sector mounted on the elevator torque tube. From the pulley sector, control motion is passed to a single cable system which is routed through the forward pulley gang at the bottom of the center console, through to the rudder/elevator pulley gang under the baggage floor, and finally to the elevator actuation pulley. The elevator actuation pulley drives a push/pull rod attached to the elevator bellcrank which is bolted directly to the elevators. Each set of pulleys has a cable retainer to prevent fouling. Adjustable control stops at the elevator actuation pulley limit control surface travel.

Serials 0498 & subs: Elevator control motion is transferred by the control yoke through a linkage to a bellcrank weldment on the elevator torque tube. From the bellcrank, control motion is transferred to a single cable system which is routed to the forward pulley gang at the bottom of the center console, through to the rudder/elevator pulley gang under the baggage floor, and finally to the elevator empennage bellcrank. The elevator empennage bellcrank drives a push/pull rod attached to the aft elevator bellcrank which is bolted directly to the elevators. Each set of pulleys has a cable retainer to prevent fouling. Fixed control stops at the elevator empennage bellcrank limit control surface travel.

The pitch trim system employs a ground adjustable trim tab and a spring cartridge activated by an electric motor. The spring cartridge, directly connected to the elevator bellcrank and the electric trim motor, provides a centering force regardless of the direction of control surface deflection. When activated, the trim motor moves the spring cartridge causing the elevator bellcrank to move the elevator to a new trimmed position. A 4-way switch, mounted on both yoke grips, controls the pitch trim system.

WARNING: A system rigging Inspection/Check must be performed after loosening any flight control cable to assure proper control surface operation. Refer to the appropriate control system's rigging procedures for the Inspection/Check maintenance practices.



LEGEND

1. Bolt
2. Washer
3. Nut
4. Cotter Pin
5. Torque Tube Coupler Weldment
6. Elevator Cable
7. Bracket
8. Forward Pulley Gang
9. Pin
10. Rudder/Elevator Pulley Gang
11. Turnbuckle
12. Elevator Empennage Bellcrank
13. Bushing

Figure 27-303
Elevator System Cables - Serials 0498 & subs

EFFECTIVITY:
Serials 0498 & subs

RUDDER AND YAW TRIM SYSTEM

1. DESCRIPTION

This section describes that portion of the flight control system which controls the position and movement of the rudder. Included are; rudder system rigging, rudder pedal assembly, cables, pulleys and bellcranks, rudder-aileron interconnect, and yaw trim system.

Serials 0002 thru 0497: Rudder control motion is transferred by the rudder pedals to the forward pulley gang at the bottom of the center console. From the pulley gang, control motion is passed to a single cable system which is routed under the cabin floor to the rudder-aileron interconnect, through to the rudder/elevator pulley gang under the baggage floor, and finally to the rudder actuation pulley. The rudder actuation pulley drives a push/pull rod attached to the rudder bellcrank which is bolted directly to the rudder. The rudder and elevator control system utilize separate actuation pulleys which mount to a shared pulley-gang bracket mounted inside the empennage. Each set of pulleys has a cable retainer to prevent fouling. Adjustable control stops at the rudder actuation pulley limit control surface travel. Two springs attached to the rudder pedal assembly and firewall provide rudder system interconnection and determine system cable tension.

Serials 0498 & subs: Rudder control motion is transferred by the rudder pedals to the forward pulley gang at the bottom of the center console. From the pulley gang, control motion is transferred to a single cable system which is routed under the cabin floor to the rudder-aileron interconnect *(Serials 0498 thru 2437)*, through to the rudder/elevator pulley gang under the baggage floor, and finally to the rudder empennage bellcrank. The rudder empennage bellcrank drives a push/pull rod attached to the aft rudder bellcrank which is bolted directly to the rudder. The rudder and elevator control system utilize separate bellcranks connected by a shared shaft mounted directly to the FS 306 bulkhead. Fixed control stops at the rudder empennage bellcrank limit control surface travel. Two springs attached to the rudder assembly and firewall provide rudder system interconnection and determine system cable tension.

The yaw trim system employs either an electric trim tab (*Serials 0004 thru 0168*), or a ground-adjustable trim tab (*Serials 0002, 0003, 0169 & subs*). Neutral rudder position is held by a ground-adjustable spring cartridge which bolts to the left rudder pedal torque tube and center console assembly. The cartridge is a captured compression spring that provides a centering force regardless of the direction of control surface deflection.

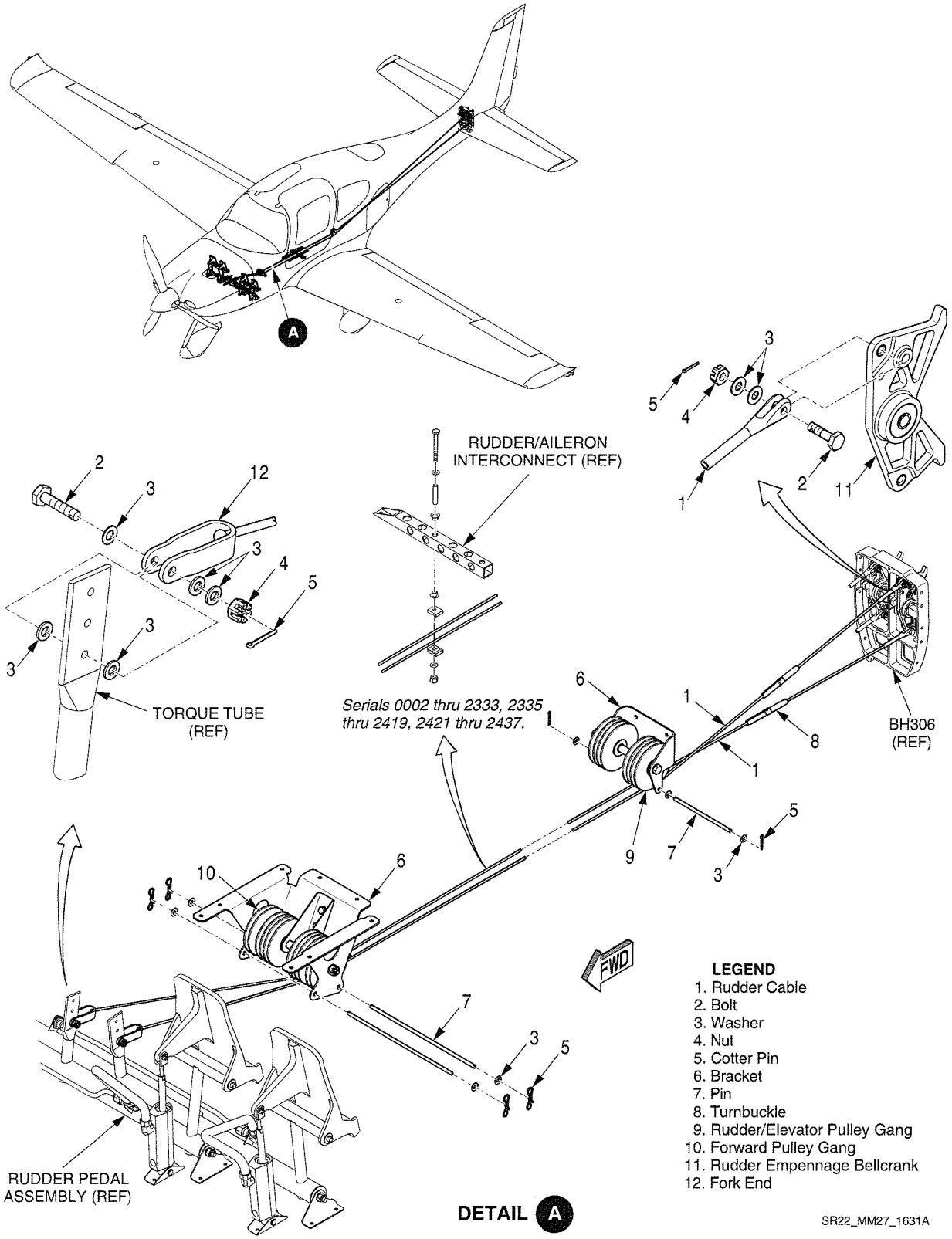


Figure 27-202
Rudder System Cables - Serials 0498 & subs

EFFECTIVITY:
Serials 0498 & subs