TEMPERATURE CONTROL

1. DESCRIPTION

- *Serials 0002 thru 1862:*

  The temperature, volume, and flow selection are regulated by manipulation of the cabin temperature and cabin air selector knobs on the lower right side of the instrument panel.

  Conditioned air from the mixing chamber can be proportioned and directed to the windshield or passengers by manipulating the cabin air selector. The control is linked to a door at the outlet end of the mixing chamber. Rotating the control full counterclockwise to the miniature windshield shuts off airflow to the passenger air distribution system and allows maximum airflow to the windshield diffuser. Rotating the knob full clockwise to the seated person icon shuts off airflow to the windshield diffuser and allows maximum airflow to the passenger air distribution system. The control can be positioned to allow any proportion of windshield and passenger air.

  Conditioned air for the forward seats is routed to outlets under the instrument panel at knee level. Conditioned air for the aft seats is ducted to outlets beneath the forward seats near the door posts and exits at floor level.

  The amount of heated air allowed into the air mixing chamber is controlled by rotating the Cabin Heat Control, located inboard of the Cabin Air Selector. The control is mechanically linked to a door in a heater box between the heater muff and the mixing chamber. Rotating the control full counterclockwise bypasses heated air from the heater muff into the engine compartment. Rotating the control clockwise opens the door in the heater box allowing heated air to enter the mixing chamber.

  The amount of cooling air allowed into the air mixing chamber is controlled by rotating the cabin cool control, located outboard of the cabin air selector. The control is mechanically linked to a butterfly valve at the fresh air entrance to the mixing chamber. Rotating the control full counterclockwise shuts down cooling airflow to the mixing chamber from the fresh air inlet in the right wing root. Rotating the control clockwise opens the butterfly allowing fresh cooling air to enter the mixing chamber. Rotating the knob to the full clockwise position provides maximum cooling airflow to the mixing chamber.

- *Serials 1863 & subs w/o Air Conditioning:*

  The airflow, vent, and temperature selection are regulated by manipulation of the cabin air selector knobs on the lower right side of the instrument panel.

  Serials 1863 thru 2437: The airflow selector regulates the volume of airflow allowed into the cabin distribution system through mechanical linkage to a butterfly valve in the distribution manifold. If option installed, the 2-speed blower fan is turned on when the selector dial exceeds the full open position.

  Serials 2438 & subs: The airflow selector on the system control panel regulates the volume of airflow allowed into the cabin distribution system through the use of an electro-mechanical linkage to a flapper valve in the mixing chamber on the forward firewall. When the airflow selector fan speed is moved to the 1, 2, or 3 position the electro-mechanical linkage actuates the flapper valve to the full open position. The air is then distributed by the variable speed blower fan to the distribution manifold mounted to the center, aft side of the firewall.

  Conditioned air from the distribution manifold can be proportioned and directed to passengers and/or the windshield by manipulating the cabin vent selector. The selector is mechanically linked to butterfly valves at the entrances to the windshield diffuser and the cabin floor ducting. There is continuous airflow to the panel and armrest eyeball outlets. Each occupant can control the flow rate from 'off' to maximum by rotating the nozzle.

  When the vent selector is in the far left position, both butterfly valves are closed providing maximum airflow to the panel and armrest eyeball outlets. Rotating the selector a quarter-turn clockwise opens the cabin floor butterfly valve allowing airflow to the rear seat foot warmer diffusers and the front seat outlets mounted to the underside of each kickplate. Rotating the selector another quarter-turn clockwise opens the windshield diffuser butterfly valve which permits shared airflow to the defrosting mech-

anism and cabin floor outlets. When the selector is in the far right position, the cabin floor butterfly valve is closed providing maximum airflow to the windshield diffuser.

The temperature selector is mechanically linked to the hot air intake valve and fresh air intake valve. Rotating the selector simultaneously opens and closes the two valves, permitting hot and cold air to mix and enter the distribution system. Rotating the selector clockwise, permits warmer air to enter the system - counterclockwise, cooler air.

- *Serials 1863 & subs w/ Air Conditioning:*

The air conditioning system is regulated by manipulation of the cabin air selector knobs on the lower right side of the instrument panel.

*Serials 1863 thru 2437: T*he airflow selector regulates the volume of airflow allowed into the cabin distribution system through mechanical linkage to a butterfly valve in the distribution manifold. When the selector dial exceeds the full open position, the 3-speed blower fan is turned on.

Serials 2438 & subs: The airflow selector on the system control panel regulates the volume of airflow allowed into the cabin distribution system through the use of an electro-mechanical linkage to a flapper valve in the mixing chamber on the forward firewall. When the airflow selector fan speed is moved to the 1, 2, or 3 position the electro-mechanical linkage actuates the flapper valve to the full open position. The air is then distributed by the variable speed blower fan to the distribution manifold mounted to the center, aft side of the firewall.

Conditioned air from the distribution manifold can be proportioned and directed to passengers and/or the windshield by manipulating the cabin vent selector. The selector is mechanically linked to butterfly valves at the entrances to the windshield diffuser and the cabin floor ducting. There is continuous airflow to the panel and armrest eyeball outlets. Each occupant can control the flow rate from 'off' to maximum by rotating the nozzle.

When the vent selector is in the far left position, both butterfly valves are closed providing maximum airflow to the panel and armrest eyeball outlets. Rotating the selector a quarter-turn clockwise opens the cabin floor butterfly valve allowing airflow to the rear seat foot warmer diffusers and the front seat outlets mounted to the underside of each kickplate. Rotating the selector another quarter-turn clockwise opens the windshield diffuser butterfly valve which permits shared airflow to the defrosting mechanism and cabin floor outlets. When the selector is in the far right position, the cabin floor butterfly valve is closed providing maximum airflow to the windshield diffuser. When the full/max defrost position is selected, the air conditioner is activated to provide conditioned, dry air to the diffuser to facilitate windshield defogging.

The temperature selector is mechanically linked to the hot air intake valve and fresh air intake valve. Rotating the selector simultaneously opens and closes the two valves, permitting hot and cold air to mix and enter the distribution system. Rotating the selector clockwise, permits warmer air to enter the system - counterclockwise, cooler air. When the temperature selector is moved to the snowflake symbol, the hot air valve completely closes and the air-conditioner is activated. When recirculation symbol is selected, the fresh air valve completely closes and cabin air is recirculated to provide for maximum air-conditioning operation. The A/C ON light will illuminate when the snowflake or recirculation symbol is selected.

2. TROUBLESHOOTING

Serials 1863 & subs:

Trouble	Probable Cause	Remedy
Controls stiff or binding.	Control cams binding with switch plate.	Perform Inspection/Check - Cabin Air Control Assembly. (Refer to 21-60)
Controls inoperable.	Control linkage misaligned or disconnected.	Perform Adjustment/Test - Cabin Air Control Assembly. (Refer to 21-60)
Poor airflow control.	Control linkage misaligned or disconnected.	Perform Adjustment/Test - Cabin Air Control Assembly. (Refer to 21-60)
	Faulty distribution manifold.	Replace or repair distribution manifold. (Refer to 21-20)
Vent selection inoperable.	Control linkage misaligned or disconnected.	Perform Adjustment/Test - Cabin Air Control Assembly. (Refer to 21-60)
	Faulty distribution manifold.	Replace or repair distribution manifold. (Refer to 21-20)
Poor temperature control.	Control linkage misaligned or disconnected.	Adjust or connect control linkage. (Refer to 21-60)
Fan inoperable.	Faulty or misaligned switch.	Replace or align switch. (Refer to 21-60)
Air conditioning inoperable.	Faulty or misaligned switch.	Replace or align switch. (Refer to 21-60)
Fresh or conditioned air feels warm.	Hot air valve not sealing tight in HEAT OFF position.	Adjust or connect control linkage. (Refer to 21-60) Replace hot air valve. (Refer to 21-40)

3. MAINTENANCE PRACTICES

A. Cabin Air Control Knobs - *Serials 0002 thru 1862* (See Figure 21-601)

(1) Removal - Cabin Air Control Knob

(a) Remove set screws securing control knob to linkage shaft. Discard set screws.

(b) Remove control knob from airplane.

(2) Installation - Cabin Air Control Knob

(a) Rotate linkage shaft fully counter-clockwise.

(b) Position control knob to linkage shaft in fully counter-clockwise position.

(c) Install new set screws securing control knob to linkage shaft.

(d) Perform Inspection/Check - Cabin Air Control Knob.

(3) Inspection/Check - Cabin Air Control Knob

(a) Ensure control knob rotates linkage shaft through full range of motion without excess binding, friction, or slippage.

B. Hot Air Valve Control Cable - *Serials 0002 thru 1862* (See Figure 21-601)

(1) Removal - Hot Air Valve Control Cable

(a) Remove engine cowling. (Refer to 71-10)

(b) Solvent clean adhesive (with alcohol) from cable pass-through on the forward side of the firewall. (Refer to 20-30)

(c) Loosen lower cable stop bolt from hot air valve actuation arm.

(d) Loosen cable stop bolt from inner core wire. Slide cable stop off heater cable core wire.

(e) Loosen clamp fastened to angle bracket and engine mount. Slide cable out of clamp.

(f) Remove MFD. (Refer to 31-60)

(g) Remove RH kick plate. (Refer to 25-10)

(h) Remove adhesive from cable pass-through on aft side of firewall.

(i) Remove bolt, washers, and nut securing core wire to linkage shaft.

(j) Remove bolt, washers, and nut securing cable and clamp to cable bracket. Remove clamp.

(k) Pull hot air valve cable, cable stop, and Fiberfrax paper out of cable pass-through.

(2) Installation - Hot Air Valve Control Cable

(a) Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Fiberfrax paper 1/8”	970J, TON0146	UniFrax	Firewall insulation.
Dow Corning Silicone Sealant	RTV 736	Any Source	Provide air-tight seal between cabin and engine compartment.
Isopropyl Alcohol	TT-I-735 Grade A or B	Any Source	Remove adhesive.

(b) Insert hot air valve cable (wrapped with Fiberfrax) through cable pass-through and into position. (Refer to 20-10)

(c) Slide cable through clamp mounted to angle bracket and engine mount.

Note: Ensure clamp is positioned properly and that controls do not interfere with any other components.

(d) Secure cable and clamp to angle bracket.

(e) Slide lower cable stop over inner core wire.

(f) Secure lower cable stop bolt and inner core wire to hot air valve actuation arm.

(g) Apply silicone adhesive over entire cable pass-through on both sides of firewall. (Refer to 20-10)

(h) Secure cable to linkage shaft with bolt, washers, and nut.

(i) Wrap clamp around upper end of hot air valve control cable.

(j) Tighten bolt, washers, and nut to secure cable and clamp to cable bracket.

(k) Adjust and secure inner core wire cable stop. (Refer to 21-60)

(l) Install MFD. (Refer to 31-60)

(m) Install RH kick plate. (Refer to 25-10)

(n) Install engine cowling. (Refer to 71-10)

(o) Verify proper operation of temperature controls.

(3) Adjustment/Test - Hot Air Valve Control Cable

(a) Remove MFD. (Refer to 31-60)

(b) Remove engine cowling. (Refer to 71-10)

(c) Loosen cable stop bolt from inner core wire (located above hot air valve actuation arm).

(d) Loosen hot air valve actuation arm cable stop bolt.

(e) Set temperature control knob to full heat position.

(f) Position hot air valve flap in the full heat position by pushing down on the control arm.

(g) Secure heater cable core wire to hot air valve actuation arm by tightening bolt into actuation arm cable stop.

(h) Set temperature control knob to full off position.

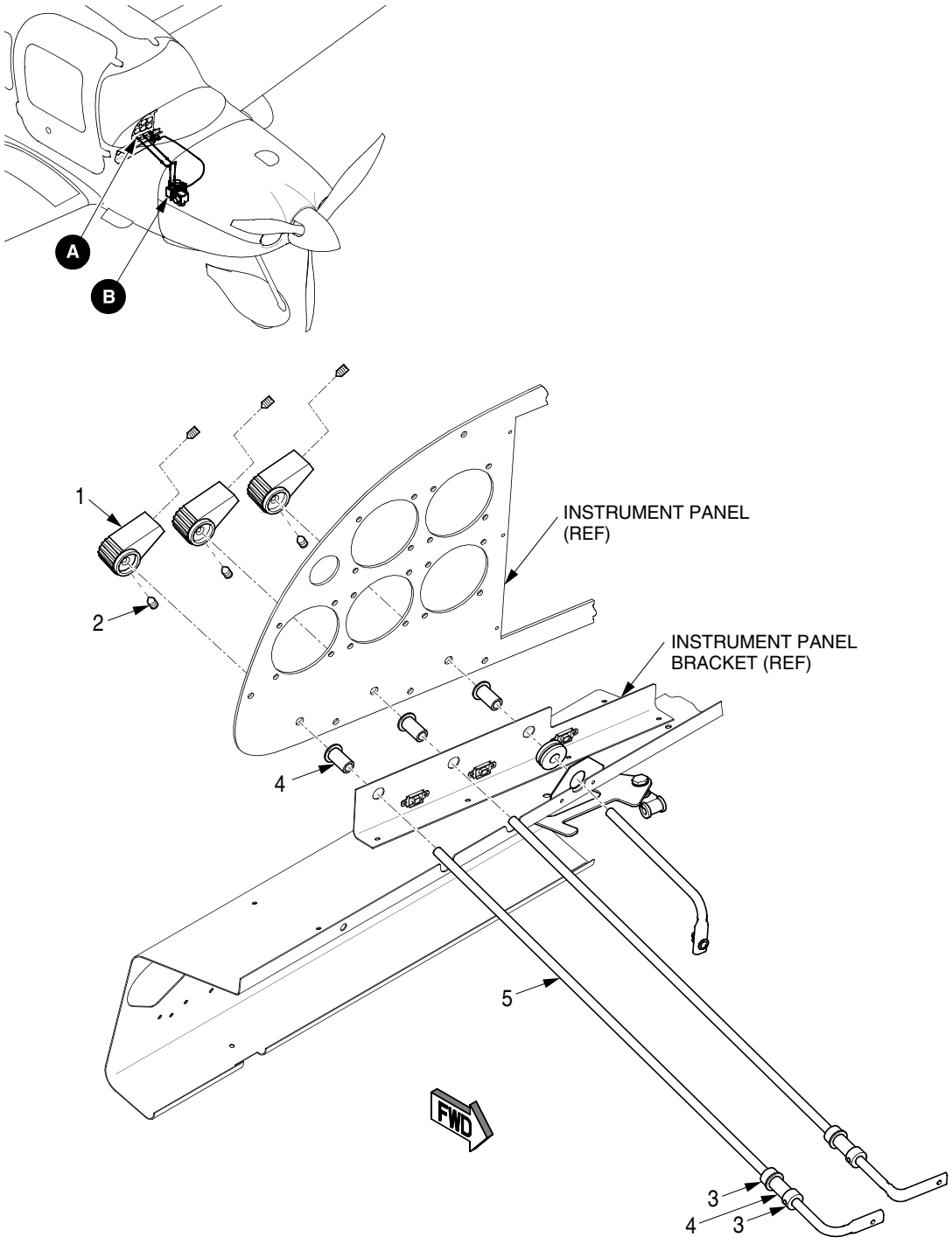
(i) Slide lower cable stop up to outer cable housing and secure cable stop bolt.

(j) Verify hot air valve is fully closed with no gap.

(k) Install MFD. (Refer to 31-60)

(l) Install engine cowling. (Refer to 71-10)

(m) Verify proper operation of temperature controls.



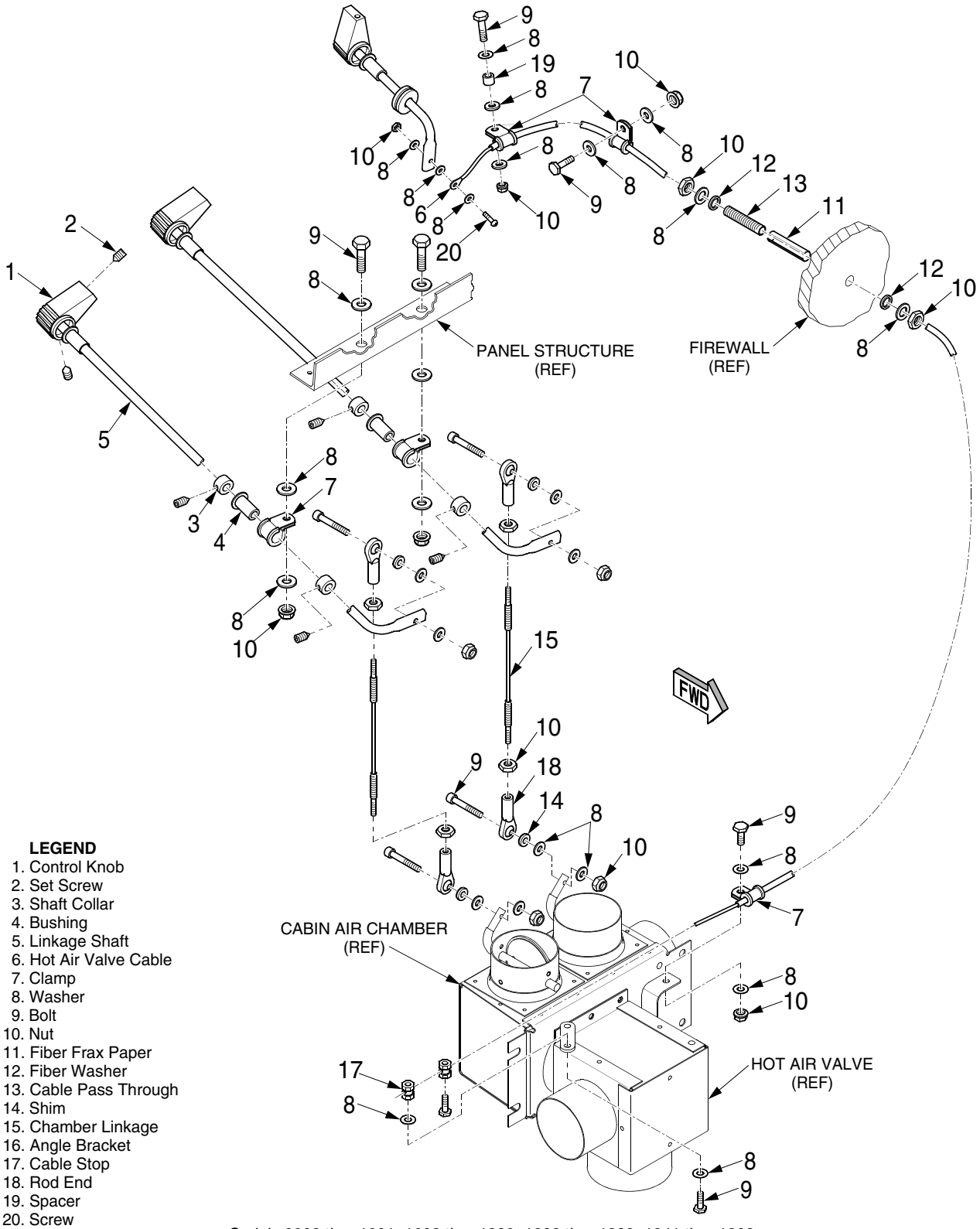
LEGEND
1. Control Knob
2. Set Screw
3. Shaft Collar
4. Bushing
5. Linkage Shaft

Serials 0002 thru 1601, 1603 thru 1820, 1822 thru 1839, 1841 thru 1862.

DETAIL A

SR22_MM21_1405A

Figure 21-601
Cabin Air Control Assembly Installation - Serials 0002 thru 1862 (Sheet 1 of 2)



Serials 0002 thru 1601, 1603 thru 1820, 1822 thru 1839, 1841 thru 1862.

DETAIL B

SR22_MM21_1406C

Figure 21-601
Cabin Air Control Assembly Installation - Serials 0002 thru 1862 (Sheet 2 of 2)

EFFECTIVITY:
Serials 0002 thru 1862

C. Cabin Air Control Knobs - *Serials 1863 & subs* **(See Figure 21-602) (See Figure 21-606)**

(1) Removal - Cabin Air Control Knob

(a) Loosen set screw securing control knob to cam shaft assembly.

(b) Remove knob from airplane.

(2) Installation - Cabin Air Control Knob

(a) Rotate cam shaft assembly fully counter-clockwise.

(b) Position control knob to cam shaft assembly in fully counter-clockwise position.

(c) Install set screw securing control knob to cam shaft assembly.

(d) Perform Inspection/Check - Cabin Air Control Knob. (Refer to 21-60)

(3) Inspection/Check - Cabin Air Control Knob

(a) Verify control knob orientation aligns with corresponding function on graphic overlay.

(b) Ensure control knob rotates cam shaft assembly through full range of motion without excess binding, friction, or slippage.

D. Cabin Air Control Assembly - *Serials 1863 thru 2437* **(See Figure 21-602)**

(1) Removal - Cabin Air Control Assembly

(a) Pull COMPRESSOR/CONTROL PANEL circuit breaker.

(b) Remove glareshield. (Refer to 25-10)

(c) Remove cabin air control knobs. (Refer to 21-60)

(d) Remove bolt, washer, and wire stop securing cabin air coupler linkage to airflow control lever.

(e) Remove nut, washers, and spacer securing airflow linkage to airflow cam lever.

(f) Remove nut, washers, and spacer securing defrost linkage to vent bellcrank.

(g) Remove nut, washers, and spacer securing heat linkage to vent bellcrank.

(h) Remove bolt, washers, clamp, and nut securing cabin air control assembly rod to wire loom.

(i) Remove screws and washers securing cabin air control assembly to XM Weather bracket. Remove cabin air control assembly from airplane.

(2) Disassembly - Cabin Air Control Assembly

(a) Remove bolt, washers, and spacer securing temperature cam lever to cam assembly.

(b) Remove bolt, washers, and spacer securing airflow cam lever to cam assembly.

(c) Remove shaft collar, spring, and washer securing vent cam assembly, nylon ball, and detent spring to switch plate.

(d) Remove shaft collar, spring, and washer securing temperature cam assembly, nylon ball, and detent spring to switch plate.

(e) Remove shaft collar, spring, and washer securing airflow cam assembly, nylon ball, and detent spring to switch plate.

(3) Assembly - Cabin Air Control Assembly

(a) Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Aeroshell ASG22	MIL-G-81322	Any Source	Lubricate control assembly.

(b) Position airflow cam assembly to switch plate and secure with shaft collar, spring, and washer. Compress spring such that shaft collar is flush to switch plate bushing. Tighten set screw.

(c) Position temperature cam assembly to switch plate and secure with shaft collar, spring, and washer. Compress spring such that shaft collar is flush to switch plate bushing. Tighten set screw.

(d) Position vent cam assembly, washer, spring, and shaft collar to switch plate but do not tighten.

(e) Insert detent spring into vent cam.

(f) Position control assembly vertically with bellcranks facing up.

(g) Position nylon ball in detent hole between vent cam and switch plate.

(h) Press vent cam and detent spring down to ball and fully compress while pressing shaft collar flush to switch plate bushing. Tighten set screw.

(i) Insert nylon ball and detent spring into temperature cam.

(j) While compressing detent spring with washers, position temperature cam lever to cam assembly and secure with bolt, washers, and spacer.

(k) Insert nylon ball and detent spring into airflow cam.

(l) While compressing detent spring with washers, position airflow cam lever to cam assembly and secure with bolt, washers, and spacer.

(m) Perform Inspection/Check - Cabin Air Control Assembly. (Refer to 21-60)

(n) Ensure proper operation of airflow control cam assembly.

1 Verify knob moves freely through full range of motion from stop to stop.

2 Verify no detectable or significant friction change or binding exists between cam and cam lever.

3 Verify cam reaches end stop pins before reaching end travel within cam lever slot.

4 Verify knob rotates outer tri-axial control lever.

(o) Ensure proper operation of vent control cam assembly.

1 Verify no detectable or significant friction change or binding exists between cam and cam lever.

2 Verify knob rotates inner tri-axial control lever.

(p) Ensure proper operation of temperature control cam assembly.

1 Verify knob moves freely through full range of motion from stop to stop.

2 Verify no detectable or significant friction change or binding exists between cam and cam lever.

3 Verify cam reaches end stop pins before reaching end travel within cam lever slot.

4 Verify knob rotates middle tri-axial control lever.

(4) Installation - Cabin Air Control Assembly

(a) Set airflow control to OFF position.

(b) Set vent control to DEFROST position.

(c) Set temperature control to HOT position.

(d) Position cabin air control assembly to instrument panel bracket and secure with screws and washers.

(e) Position cabin air control assembly rod to wire loom and secure with bolt, washers, clamp, and nut.

(f) Position heat linkage to control bellcrank and secure with spacer, washers, and nut.

(g) Position defrost linkage to control bellcrank and secure with spacer, washers, and nut.

(h) Position airflow linkage to airflow cam lever assembly and secure with spacer, washers, and nut.

(i) Position cabin air coupler linkage to airflow control lever and secure with bolt, washer, and wire stop.

(j) Install cabin air control knobs. (Refer to 21-60)

(k) Perform Adjustment/Test - Cabin Air Control Assembly. (Refer to 21-60)

(l) Install glareshield. (Refer to 25-10)

(m) Reset COMPRESSOR/CONTROL PANEL circuit breaker.

(5) Inspection/Check - Cabin Air Control Assembly

(a) Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Aeroshell ASG22	MIL-G-81322	Any Source	Lubricate control assembly.

(b) Pull COMPRESSOR/CONTROL PANEL circuit breaker.

(c) Remove glareshield. (Refer to 25-10)

Note: Lubricant is allowed between control cam assemblies and microswitch rollers but is not required.

(d) Lubricate cabin air control assembly.
1 Apply lubricant between control cam assemblies and face of switch plate.
2 Apply lubricant between spacer and inside of temperature and airflow cam lever slots.
3 Apply lubricant between detent balls, springs, control cam assemblies, and switch plate.
(e) Rotate control knobs through all positions to facilitate distribution of lubricant.
(f) Verify control knobs move through full range of motion without excess binding or friction.
(g) Install glareshield. (Refer to 25-10)
(h) Reset COMPRESSOR/CONTROL PANEL circuit breaker.

(6) Adjustment/Test - Cabin Air Control Assembly
(a) Set airflow control knob to OFF position.

CAUTION: Any gap when control is in off position is unacceptable.

(b) Verify distribution manifold airflow valve is in the closed position.
(c) Set airflow control knob to MAXIMUM AIRFLOW position available without selecting fan.
(d) Verify distribution manifold airflow valve is in the open position.
(e) Ensure airflow control knob moves through full range of motion without excess binding or friction.
(f) *Serials 1863 & subs w/ Fan or Air Conditioning:* Verify fan operation.
1 Rotate airflow control knob through all FAN positions.
2 Verify all fan positions are selectable and micro switches engage as appropriate for selected function.
3 Verify distribution manifold airflow valve demonstrates no appreciable motion when selecting between fan positions.
(g) Rotate all eyeball outlets counter-clockwise to open positions.
(h) Set vent control knob fully counter-clockwise to PANEL VENTS ONLY position.
(i) At distribution manifold, verify windshield defroster and floor vent valves are closed, and panel vent valve is open.
(j) Rotate vent control knob 90° clockwise to PANEL AND FLOOR VENTS ONLY position.
(k) Verify windshield defroster valve is closed, and panel and floor vent valves are open.
(l) Rotate vent control knob 90° clockwise to DEFROSTER, FLOOR VENTS, AND PANEL VENTS position.
(m) At distribution manifold, verify windshield defroster and floor vent valves are open.
(n) Rotate vent control knob 90° clockwise to DEFROSTER ONLY position.
(o) Rotate all eyeball outlets clockwise to closed positions.
(p) At distribution manifold, verify windshield defroster valve is open, and floor vent valves are closed.
(q) Ensure vent control knob moves through full range of motion without excess binding or friction.
(r) Set temperature control knob to HEAT OFF position.
1 Verify hot air valve is fully closed with no gap.
2 Verify fresh air valve is fully open.
3 Verify no control assembly micro switches are engaged.
4 Verify angle between airflow control lever and cabin air coupler/distribution manifold linkage is approximately a 5 - 15°.

5 Verify coupler torque tube lever is rotated aft and angle between hot air valve/coupler linkage and coupler torque tube lever is approximately 10 - 15°.

(s) Set temperature control knob to MAXIMUM HEAT position.

1 Verify hot air valve is fully open.

2 Verify fresh air valve is fully closed.

(t) If control knob range of travel is can not be achieved smoothly, the flapper door range of travel must be increased.

1 Verify full travel exists at fresh air valve. If full travel is not present, perform Adjustment/Test - Cabin Air Coupler/Fresh Air Valve Linkage to adjust tension. (Refer to 21-60)

2 Verify full travel exists at hot air valve. If full travel is not present, perform Adjustment/Test - Cabin Air Coupler/Distribution Manifold Linkage to adjust tension. (Refer to 21-60)

(u) *Serials 1863 & subs w/ Air Conditioning:* Set temperature control knob to AIR CONDITIONING position.

1 Verify air conditioning micro switch engages.

2 Verify air conditioning recirculation micro switch does not engage.

3 Verify hot air valve is fully closed with no gap.

4 Verify fresh air valve is fully open.

(v) *Serials 1863 & subs w/ Air Conditioning:* Set temperature control knob to RECIRCULATION position.

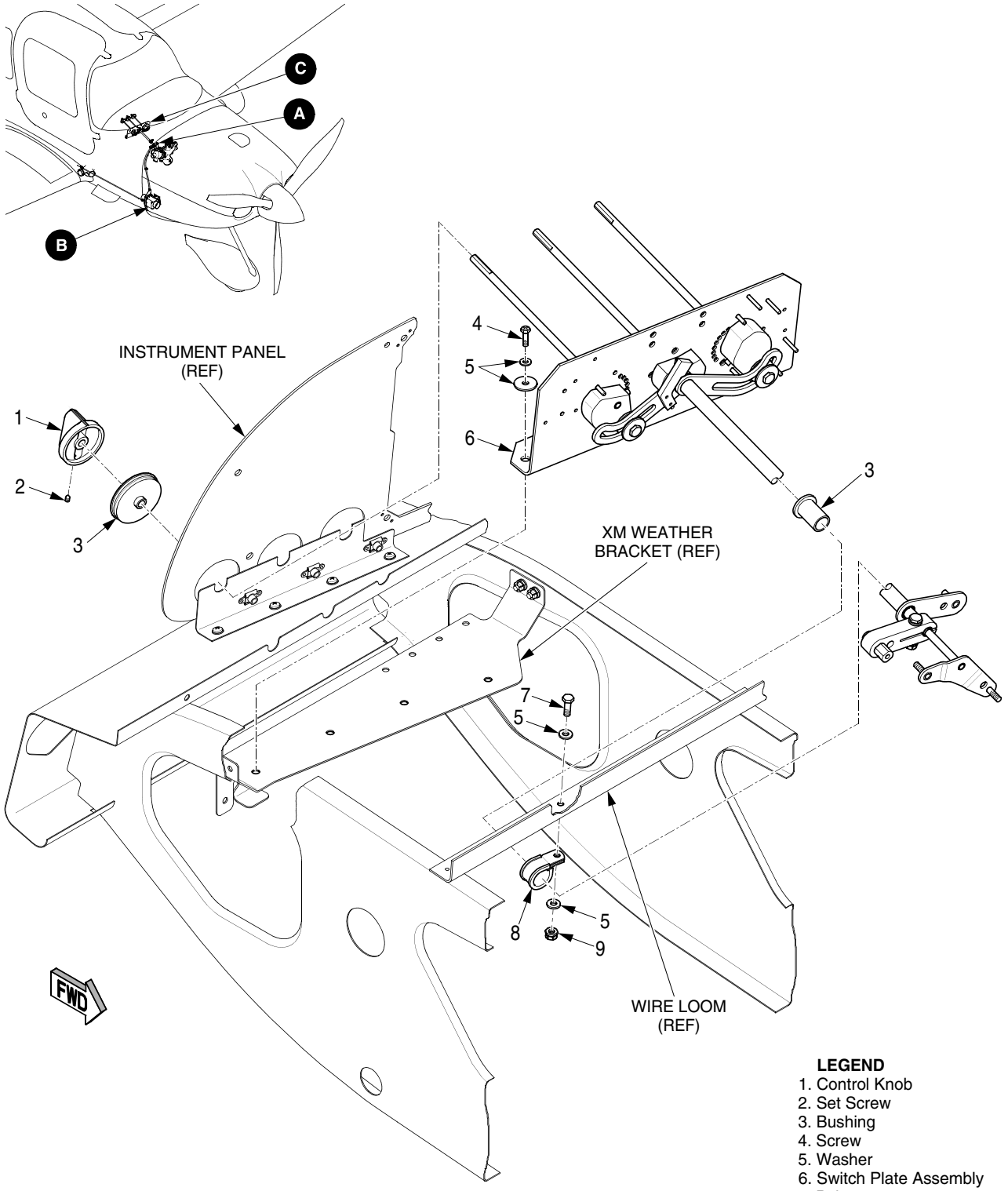
1 Verify air conditioning micro switch engages.

2 Verify air conditioning recirculation micro switch engages.

3 Verify hot air valve is fully closed with no gap.

4 Verify fresh air valve is fully open.

(w) Ensure temperature control knob moves through full range of motion without excess binding or friction.



LEGEND
1. Control Knob
2. Set Screw
3. Bushing
4. Screw
5. Washer
6. Switch Plate Assembly
7. Bolt
8. Clamp
9. Nut

Serials 1602, 1821, 1840, 1863 thru 2333, 2335 thru 2419, 2421 thru 2437.

DETAIL A

SR22_MM21_2318A

Figure 21-602
Cabin Air Control Assembly Installation - Serials 1863 thru 2437 (Sheet 1 of 2)

EFFECTIVITY:
Serials 1863 thru 2437

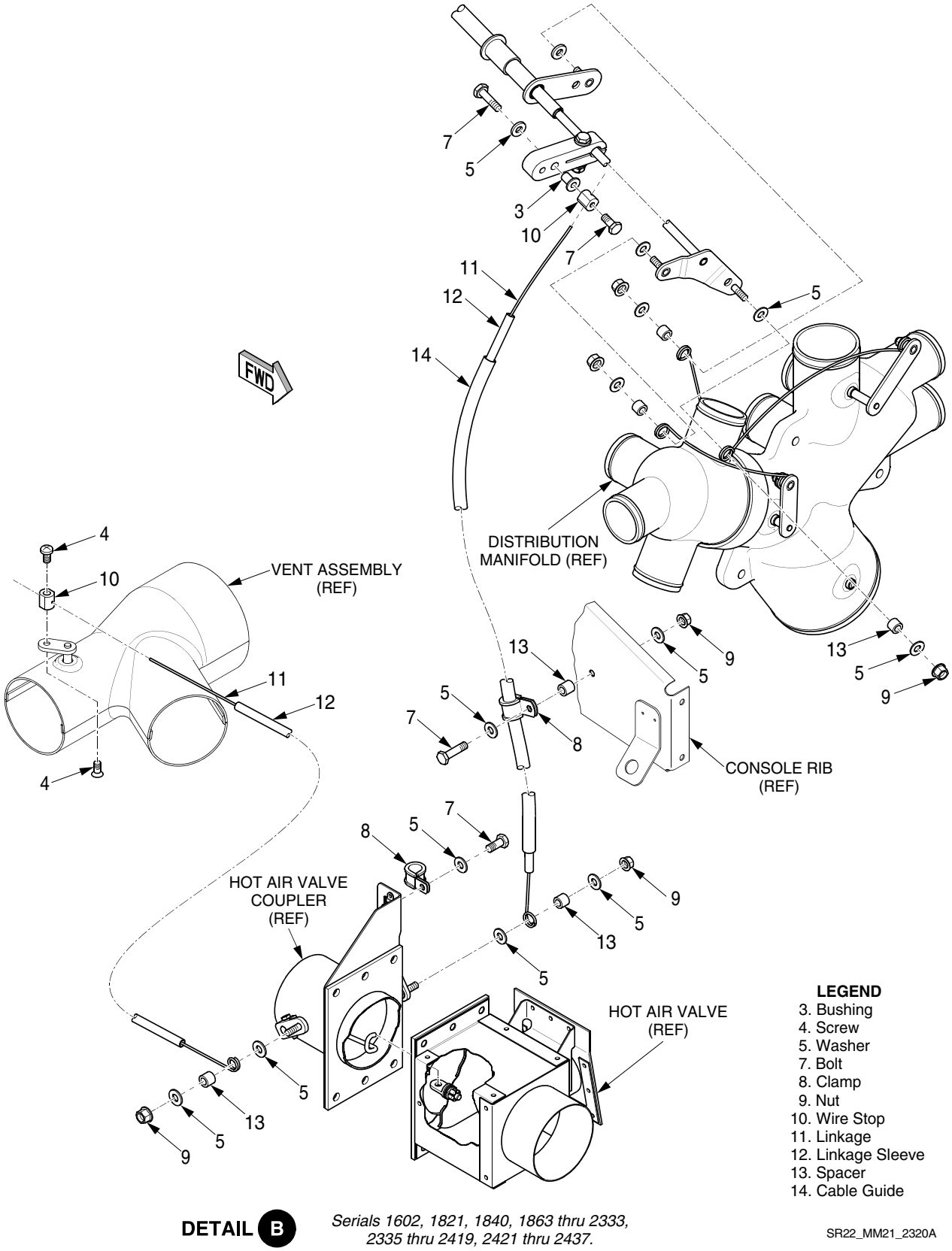
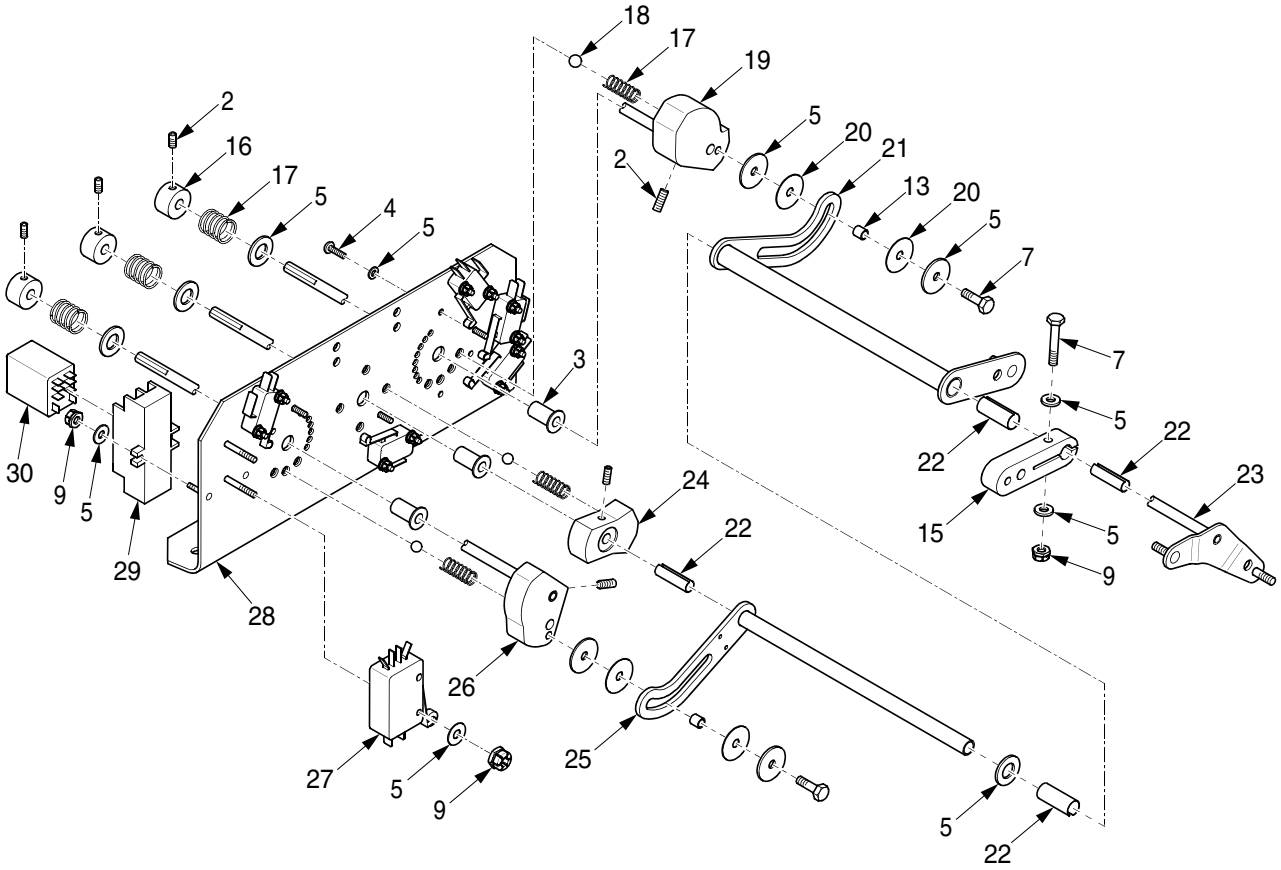


Figure 21-602
Cabin Air Control Assembly Installation - Serials 1863 thru 2437 (Sheet 2 of 2)



LEGEND

2. Set Screw
3. Bushing
4. Screw
5. Washer
7. Bolt
9. Nut
13. Spacer
15. Airflow Control Lever
16. Shaft Collar Assembly
17. Spring
18. Nylon Ball
19. Fan Control Cam
20. Teflon Washer
21. Air Flow Cam Lever
22. Nylon Strip
23. Vent Bellcrank
24. Vent Control Cam
25. Temperature Cam Lever
26. Temperature Control Cam
27. Limit Switch
28. Switch Plate
29. Relay Socket
30. Relay

SR22_MM21_2333A

Serials 1602, 1821, 1840, 1863 thru 2333, 2335 thru 2419, 2421 thru 2437.

DETAIL C

Figure 21-603
Cabin Air Control Assembly - Serials 1863 thru 2437

EFFECTIVITY:
Serials 1863 thru 2437

E. Cabin Air Coupler/Distribution Manifold Linkage - *Serials 1863 thru 2437* **(See Figure 21-604)**

(1) Removal - Cabin Air Coupler/Distribution Manifold Linkage

(a) Remove glareshield. (Refer to 25-10)

(b) Remove RH kick plate. (Refer to 25-10)

(c) Remove nut, washers, and spacer securing linkage to cabin air coupler.

(d) Remove bolt, washer, and clamp securing linkage, sleeve, and cable guide to cabin air coupler.

(e) Remove bolt, washers, spacer, nut, and clamp securing linkage, sleeve, and cable guide to console.

(f) Remove bolt, washer, and wire stop securing linkage to airflow control lever.

(2) Installation - Cabin Air Coupler/Distribution Manifold Linkage

(a) Position linkage to cabin air coupler and secure with spacer, washers, and nut.

(b) Position linkage, sleeve, and cable guide to cabin air coupler and secure with bolt, washer, and clamp.

(c) Position linkage, sleeve, and cable guide to console and secure with bolt, washers, spacer, nut, and clamp.

(d) Position linkage to distribution manifold and secure with bolt, washer, and wire stop. Ensure approximately 0.5 inch (1.27 cm) of wire extends beyond wire stop.

(e) Perform Adjustment/Test - Cabin Air Coupler/Distribution Manifold Linkage. (Refer to 21-60)

(f) Perform Adjustment/Test - Cabin Air Control Assembly. (Refer to 21-60)

(g) Install RH kick plate. (Refer to 25-10)

(h) Install glareshield. (Refer to 25-10)

(3) Adjustment/Test - Cabin Air Coupler/Distribution Manifold Linkage (See Figure 21-604)

(a) Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Wet/Dry Vacuum	-	Any Source	Provide Airflow.
Duct Tape	-	Any Source	Seal.

Note: To provide maximum airflow, ensure any gaps between vacuum nozzle and intake are sealed.

(b) Using duct tape, attach vacuum exhaust nozzle to hot air valve intake.

(c) Remove MFD. (Refer to 31-60)

(d) Remove glareshield. (Refer to 25-10)

(e) Remove lower windshield trim. (Refer to 25-10)

(f) Set temperature control knob to maximum COLD position. (Refer to 21-00)

(g) Set vacuum to exhaust function and turn on vacuum.

(h) At cabin air control assembly, locate hot air valve arm at forward end of control rod.

(i) Loosen arm clamping bolt securing clamp to control rod.

CAUTION: Ensure wire stop remains stationary when loosening wire stop bolts.

(j) Loosen forward wire stop bolt. If necessary, loosen aft wire stop bolt until wire stop is free.

(k) Ensure cable passes through wire stop freely.

(l) Looking forward, position arm upward to 3 o'clock position.

WARNING: **If flapper door does not completely close, firewall protection of the airplane is compromised.**

(m) Push cable downward to close flapper door on hot air valve completely.

(n) If length of wire does not permit any necessary adjustment to reduce tension, replace wire linkage.

(o) Tighten forward wire stop bolt (and aft, if loosened).

(p) Verify airflow in cabin has been reduced or eliminated.

(q) Set temperature control knob to maximum HOT position. (Refer to 21-00)

(r) Adjust hot air valve arm upward to open flapper door on hot air valve completely.

(s) Tighten arm clamping bolt securing clamp to control rod.

(t) Verify wire at aft side of firewall is not bowing or bent. If so, loosen arm clamping bolt and reduce wire tension. Re-tighten arm clamping bolt and re-inspect wire for bend.

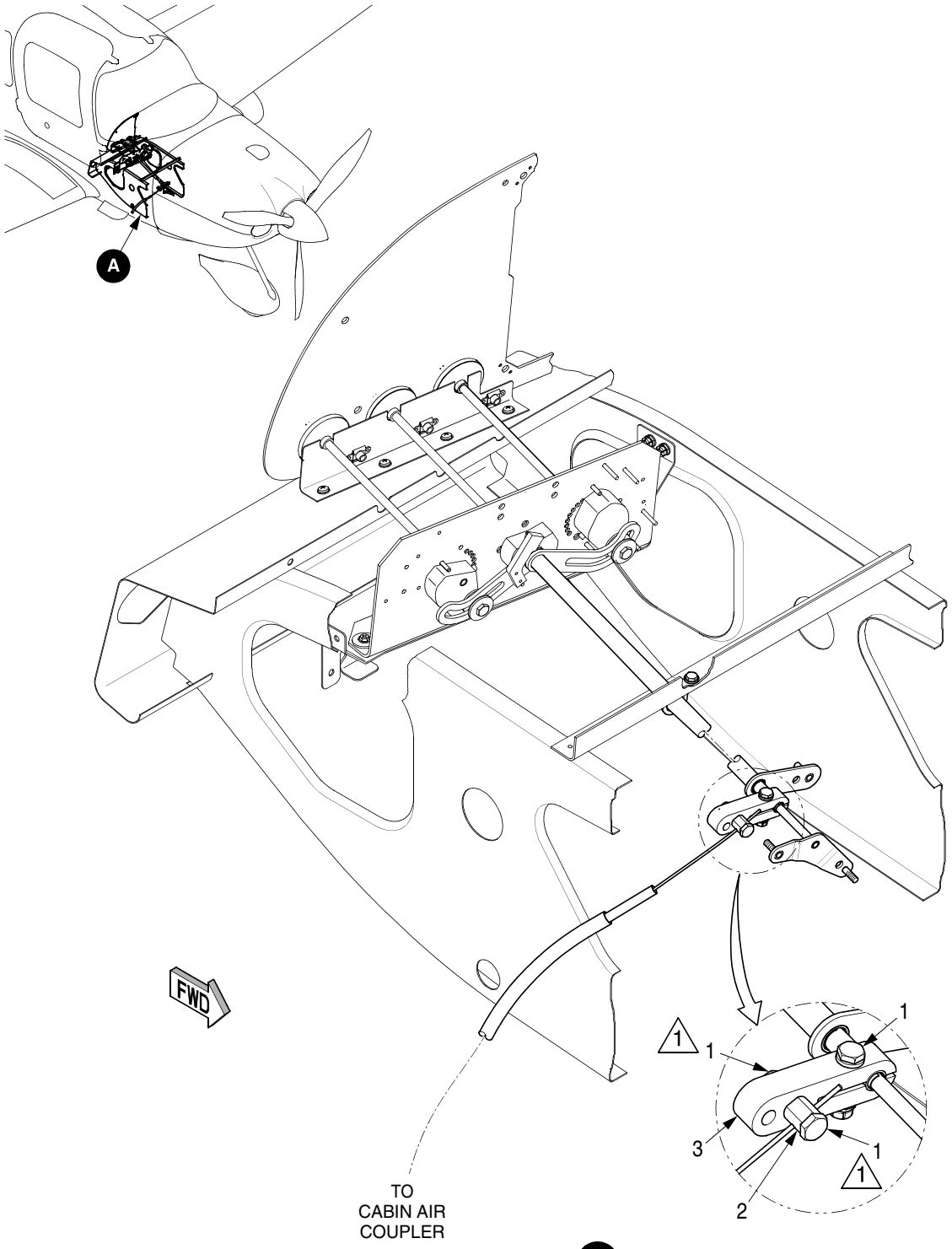
(u) Verify airflow is present in cabin.

(v) Turn off vacuum. Remove duct tape securing vacuum nozzle to intake.

(w) Install lower windshield trim. (Refer to 25-10)

(x) Install glareshield. (Refer to 25-10)

(y) Install MFD. (Refer to 31-60)



DETAIL A

Serials 1602, 1821, 1840, 1863 thru 2333, 2335 thru 2419, 2421 thru 2437.

LEGEND
1. Bolt
2. Wire Stop
3. Arm

NOTE

1 Loosen forward wire stop bolt. If necessary, loosen aft wire stop bolt until wire stop is free.

SR22_MM21_2423A

Figure 21-604
Cabin Air Coupler/Distribution Manifold Linkage - Serials 1863 thru 2437

F. Cabin Air Coupler/Fresh Air Valve Linkage - *Serials 1863 thru 2437* (See Figure 21-605)

(1) Removal - Cabin Air Coupler/Fresh Air Valve Linkage

(a) Remove RH kick plate. (Refer to 25-10)

(b) Remove sidewall air duct trim. (Refer to 25-10)

(c) Remove nut, washers, and spacer securing linkage to cabin air coupler.

(d) Remove screw securing linkage to wire stop on fresh air valve.

(e) Remove cable ties securing linkage to fuselage. Remove linkage from airplane.

(2) Installation - Cabin Air Coupler/Fresh Air Valve Linkage

(a) Position linkage to fresh air valve and secure to wire stop with screw. Ensure approximately 0.5 inch (1.27 cm) of wire extends beyond wire stop.

(b) Position linkage to cabin air coupler and secure with spacer, washers, and nut.

(c) Rotate cabin air coupler arm aft as far as limit will allow, then position linkage sleeve over linkage approximately 1.0 inch (2.54 cm) from arm and secure with cable tie approximately 3.0 inch (7.62 cm) from end of linkage sleeve.

(d) Rotate fresh air valve arm forward as far as limit will allow, then position linkage sleeve over linkage approximately 1.0 inch (2.54 cm) from arm and secure with cable tie approximately 4.0 inch (10.16 cm) from end of linkage sleeve.

(e) Install cable ties securing linkage to fuselage.

(f) Perform Adjustment/Test - Adjustment/Test - Cabin Air Coupler/Fresh Air Valve Linkage. (Refer to 21-60)

(g) Perform Adjustment/Test - Cabin Air Control Assembly. (Refer to 21-60)

(h) Install sidewall air duct trim. (Refer to 25-10)

(i) Install RH kick plate. (Refer to 25-10)

(3) Adjustment/Test - Cabin Air Coupler/Fresh Air Valve Linkage (See Figure 21-605)

(a) Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Wet/Dry Vacuum	-	Any Source	Provide Airflow.
Duct Tape	-	Any Source	Seal.

Note: To provide maximum airflow, ensure any gaps between vacuum nozzle and inlet are sealed.

(b) Using duct tape, attach vacuum exhaust nozzle to ram air inlet on RH wing.

(c) Set temperature control knob to maximum HOT position. (Refer to 21-00)

(d) Set vacuum to exhaust function and turn on vacuum.

(e) Remove bottom section of door seal to expose upper seam of sidewall duct cover. (Refer to 25-10)

(f) At upper seam of sidewall duct cover, use flashlight to locate arm on fresh air valve.

CAUTION: Ensure wire stop remains stationary when loosening wire stop screws.

(g) Loosen upper wire stop screw. If loosening upper wire stop screw does not free up wire stop, lower wire stop screw must be loosened.

1 Remove RH cabin seat. (Refer to 25-10)

2 Remove RH sidewall air duct trim. (Refer to 25-10)

3 Loosen lower wire stop screw until wire stop is free.

(h) Ensure cable passes through wire stop freely.

Note: Using inboard line-of-sight as the 12 o'clock position, the fully closed position for the flapper door is obtained with the fresh air valve arm positioned at 8 o'clock.

(i) Adjust fresh air valve arm to rotate flapper door to nominal position between current and closed position.

(j) If length of wire does not permit any necessary adjustment to reduce tension, replace wire linkage.

(k) Tighten upper wire stop screw.

(l) If lower wire stop screw was loosened:

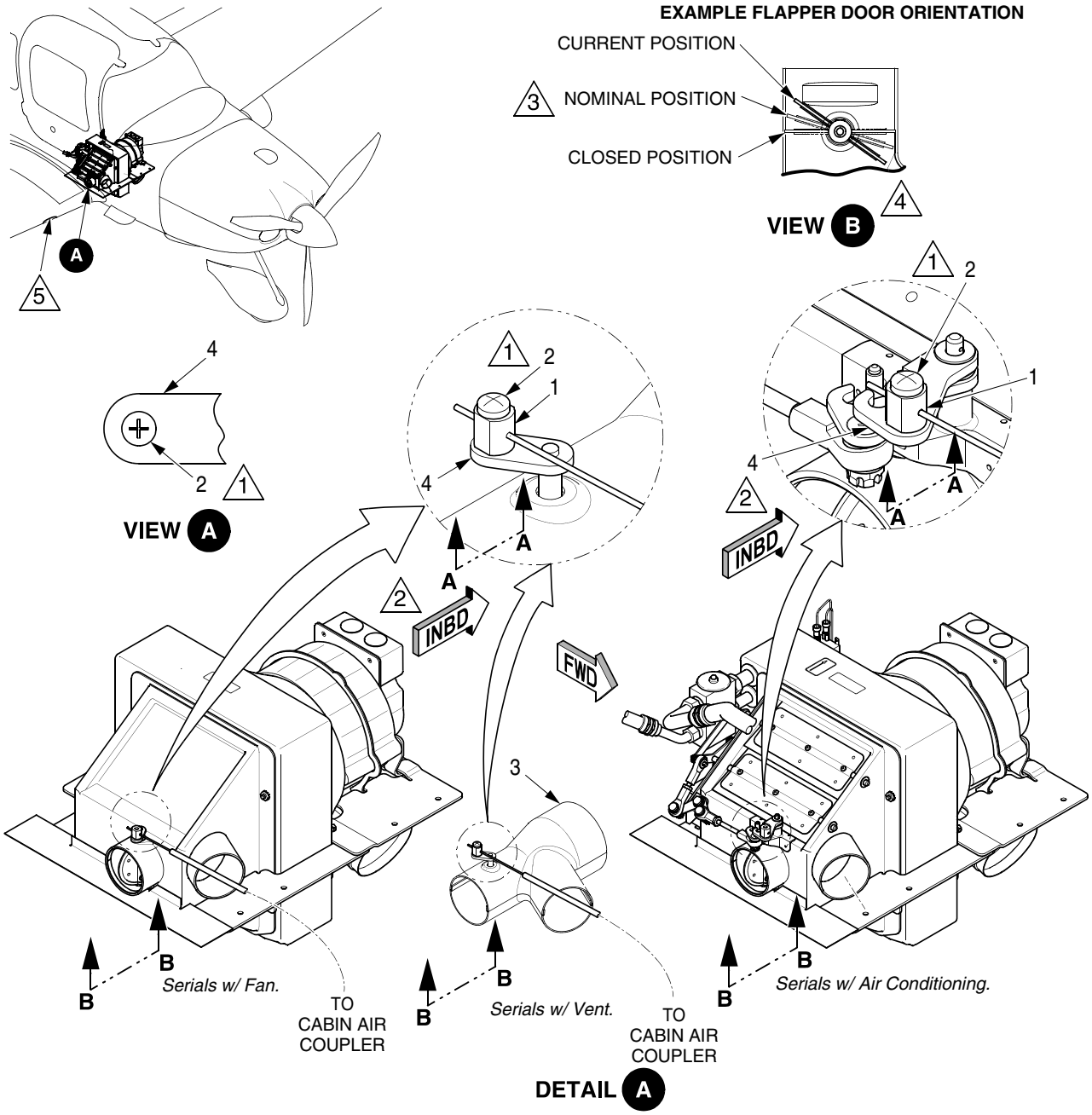
1 Tighten lower wire stop screw.

2 Install RH sidewall air duct trim. (Refer to 25-10)

3 Install RH cabin seat. (Refer to 25-10)

(m) Verify airflow in cabin has been reduced or eliminated.

(n) Turn off vacuum. Remove duct tape securing vacuum nozzle to inlet.



Serials 1602, 1821, 1840, 1863 thru 2333, 2335 thru 2419, 2421 thru 2437.

NOTE

1. Loosen upper wire stop bolt. If necessary, loosen lower wire stop bolt until wire stop is free.
2. Using inboard line-of-sight as the 12 o'clock position, the fully closed position for the flapper door is obtained with the fresh air valve arm positioned at 8 o'clock.
3. Adjust fresh air valve arm to rotate flapper door to nominal position between current and closed position.
4. Bottom of fresh air valve removed for clarity.
5. Using duct tape, attach vacuum exhaust nozzle to ram air inlet on RH wing.

LEGEND

1. Wire Stop
2. Screw
3. Fresh Air Valve
4. Arm

SR22_MM21_2425A

Figure 21-605
Cabin Air Coupler/Fresh Air Valve Linkage - Serials 1863 thru 2437

EFFECTIVITY:
Serials 1863 thru 2437

G. Cabin Air Control Assembly - *Serials 2438 & subs* **(See Figure 21-606)**

(1) Removal - Cabin Air Control Assembly

(a) Pull COMPRESSOR/CONTROL PANEL circuit breaker.

(b) Remove glareshield. (Refer to 25-10)

(c) Remove cabin air control knobs. (Refer to 21-60)

(d) Disconnect wire harness from coupler drive assembly.

(e) Remove nut, washers, and spacer securing defrost linkage to vent bellcrank.

(f) Remove bolt, washers, spacer, and nut securing heat linkage to vent bellcrank.

(g) Remove bolt, washers, and nut securing cabin air control assembly rod bearing to wire loom.

(h) Remove screws and washers securing cabin air control assembly to XM Weather bracket. Remove cabin air control assembly from airplane.

(2) Disassembly - Cabin Air Control Assembly

(a) Remove bolt, washers, and spacer securing temperature cam lever to cam assembly.

(b) Remove shaft collar, spring, and washer securing vent cam assembly, nylon ball, and detent spring to switch plate.

(c) Remove shaft collar, spring, and washer securing temperature cam assembly, nylon ball, and detent spring to switch plate.

(d) Remove set screws securing coupler to airflow shaft and switch.

(e) Remove nut and washers securing airflow switch to switch plate.

(3) Assembly - Cabin Air Control Assembly

(a) Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Aeroshell ASG22	MIL-G-81322	Any Source	Lubricate control assembly.

(b) Position airflow switch to switch plate and secure with washers and nut.

(c) Position airflow coupler and shaft to airflow switch and secure with set screws.

(d) Position temperature cam assembly to switch plate and secure with shaft collar, spring, and washer. Compress spring such that shaft collar is flush to switch plate bushing. Tighten set screw.

(e) Position vent cam assembly, washer, spring, and shaft collar to switch plate but do not tighten.

(f) Insert detent spring into vent cam.

(g) Position control assembly vertically with bellcranks facing up.

(h) Position nylon ball in detent hole between vent cam and switch plate.

(i) Press vent cam and detent spring down to ball and fully compress while pressing shaft collar flush to switch plate bushing. Tighten set screw.

(j) Insert nylon ball and detent spring into temperature cam.

(k) While compressing detent spring with washers, position temperature cam lever to cam assembly and secure with bolt, washers, and spacer.

(l) Perform Inspection/Check - Cabin Air Control Assembly. (Refer to 21-60)

(m) Ensure proper operation of airflow switch assembly.

1 Verify knob moves freely through full range of motion from stop to stop.

2 Verify no detectable or significant friction change or binding exists.

(n) Ensure proper operation of vent control cam assembly.

1 Verify no detectable or significant friction change or binding exists between cam and cam lever.

2 Verify knob rotates inner bi-axial control lever.

(o) Ensure proper operation of temperature control cam assembly.

1 Verify knob moves freely through full range of motion from stop to stop.

2 Verify no detectable or significant friction change or binding exists between cam and cam lever.

3 Verify cam reaches end stop pins before reaching end travel within cam lever slot.

4 Verify knob rotates outer bi-axial control lever.

(4) Installation - Cabin Air Control Assembly

(a) Set airflow control to OFF position.

(b) Set vent control to DEFROST position.

(c) Set temperature control to HOT position.

(d) Position cabin air control assembly to XM Weather bracket and secure with screws and washers.

(e) Position cabin air control assembly rod bearing to wire loom and secure with bolt, washers, and nut.

(f) Position heat linkage to vent bellcrank and secure with bolt, washers, spacer, and nut.

(g) Position defrost linkage to vent bellcrank and secure with spacer, washers, and nut.

(h) Connect wire harness from coupler drive assembly.

(i) Install cabin air control knobs. (Refer to 21-60)

(j) Perform Adjustment/Test - Cabin Air Control Assembly. (Refer to 21-60)

(k) Install glareshield. (Refer to 25-10)

(l) Reset COMPRESSOR/CONTROL PANEL circuit breaker.

(5) Inspection/Check - Cabin Air Control Assembly

(a) Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Aeroshell ASG22	MIL-G-81322	Any Source	Lubricate control assembly.

(b) Pull COMPRESSOR/CONTROL PANEL circuit breaker.

(c) Remove glareshield. (Refer to 25-10)

Note: Lubricant is allowed between control cam assemblies and microswitch rollers but is not required.

(d) Lubricate cabin air control assembly.

1 Apply lubricant between control cam assemblies and face of switch plate.

2 Apply lubricant between spacer and inside of temperature cam lever slot.

3 Apply lubricant between detent balls, springs, control cam assemblies, and switch plate.

(e) Rotate control knobs through all positions to facilitate distribution of lubricant.

(f) Verify control knobs move through full range of motion without excess binding or friction.

(g) Install glareshield. (Refer to 25-10)

(h) Reset COMPRESSOR/CONTROL PANEL circuit breaker.

(6) Adjustment/Test - Cabin Air Control Assembly

(a) Set airflow control knob to OFF position.

CAUTION: Any gap when control is in off position is unacceptable.

(b) Verify mixing chamber firewall flapper is in the closed position.

(c) Set airflow control knob to first detent clockwise from OFF position.

(d) Verify mixing chamber firewall flapper is in the open position.

(e) Ensure airflow control knob moves through full range of motion without excess binding or friction.

(f) *Serials 2438 & subs w/ Fan or Air Conditioning:* Verify fan operation.

1 Rotate airflow control knob through all FAN positions.

2 Verify all fan positions are selectable and fan operates as appropriate for selected function.

3 Verify mixing box firewall flapper demonstrates no appreciable motion when selecting between fan positions.

(g) Rotate all eyeball outlets counter-clockwise to open positions.

(h) Set vent control knob fully counter-clockwise to PANEL VENTS ONLY position.

(i) At distribution manifold, verify windshield defroster and floor vent valves are closed, and panel vent valve is open.

(j) Rotate vent control knob 90° clockwise to PANEL AND FLOOR VENTS ONLY position.

(k) Verify windshield defroster valve is closed, and panel and floor vent valves are open.

(l) Rotate vent control knob 90° clockwise to DEFROSTER, FLOOR VENTS, AND PANEL VENTS position.

(m) At distribution manifold, verify windshield defroster and floor vent valves are open.

(n) Rotate vent control knob 90° clockwise to DEFROSTER ONLY position.

(o) Rotate all eyeball outlets clockwise to closed positions.

(p) At distribution manifold, verify windshield defroster valve is open, and floor vent valves are closed.

(q) Ensure vent control knob moves through full range of motion without excess binding or friction.

(r) Set temperature control knob to HEAT OFF position.

1 Verify mixing chamber hot air intake valve is fully closed with no gap.

2 Verify mixing chamber fresh air intake valve is fully open.

3 Verify no control assembly micro switches are engaged.

(s) Set temperature control knob to MAXIMUM HEAT position.

1 Verify mixing chamber hot air intake valve is fully open.

2 Verify mixing chamber fresh air intake valve is fully closed.

(t) *Serials 2438 & subs w/ Air Conditioning:* Set temperature control knob to AIR CONDITIONING position.

1 Verify air conditioning micro switch engages.

2 Verify air conditioning recirculation micro switch does not engage.

3 Verify mixing chamber hot air intake valve is fully closed with no gap.

4 Verify mixing chamber fresh air intake valve is fully open.

(u) *Serials 2438 & subs w/ Air Conditioning:* Set temperature control knob to RECIRCULATION position.

1 Verify air conditioning micro switch engages.

2 Verify air conditioning recirculation micro switch engages.

3 Verify mixing chamber hot air valve is fully closed with no gap.

4 Verify mixing chamber fresh air valve is fully open.

5 Verify mixing chamber firewall flapper is fully closed with no gap.

6 Verify evaporator recirculation doors are fully open.

(v) Ensure temperature control knob moves through full range of motion without excess binding or friction.

H. Temperature Control Linkage - *Serials 2438 & subs* **(See Figure 21-606)**

(1) Removal - Temperature Control Linkage

(a) Remove engine cowling. (Refer to 71-10)

(b) Remove glareshield. (Refer to 25-10)

(c) Remove RH kick plate. (Refer to 25-10)

(d) Remove bolts, washers, nuts, and clamps securing linkage, sleeve, and cable guide to console.

(e) Remove bolt, washers, spacer, and nut securing linkage to temperature control lever.

(f) Remove bolt, washers, and wire stop securing linkage to mixing chamber lever.

(g) Remove bolt, washers, nut, and clamp securing linkage to mixing chamber guide bracket.

(h) Remove sealant from cable pass-through.

(i) Pull temperature control cable and Fiberfrax paper out of cable pass-through.

(2) Installation - Temperature Control Linkage

(a) Acquire necessary tools, equipment, and supplies.

Description	P/N or Spec.	Supplier	Purpose
Plastic Scraper	-	Any Source	Remove sealant.
Isopropyl Alcohol	TT-I-735 Grade A or B	Any Source	Solvent clean.
1/8” Fiberfrax Paper	970J or TON0146	UniFrax Corporation Niagara Falls, NY 14305 716-278-3800	Firewall insulation.
High Temperature Silicone Sealant	RTV 736	Dow Corning Corporation Midland, MI 48686-0994 989-496-4400	Sealant.

(b) Remove all old sealant from cable pass-through and firewall.

(c) Tighten nuts and washers securing cable pass-through to firewall.

(d) Using isopropyl alcohol, solvent clean cable pass-through and firewall. (Refer to 20-30)

(e) Wrap Fiberfrax paper around portion of control cable sleeve that passes through firewall so a tight fit exists between control cable sleeve and cable pass-through.

(f) Position linkage to temperature control lever and secure with bolt, washers, spacer, and nut.

(g) Position linkage to mixing chamber lever and secure with bolt, washers, and wire stop. Ensure approximately 0.5 inch (1.27 cm) of wire extends beyond wire stop.

(h) Position linkage to mixing chamber guide bracket and secure with bolt, washers, nut, and clamp.

(i) Position linkage, sleeve, and cable guide to console and secure with bolts, washers, nuts, and clamps.

(j) Fillet seal and cover entire cable pass-through on both sides of firewall with high temperature silicone sealant. (Refer to 20-10)

(k) Allow sealant to cure.

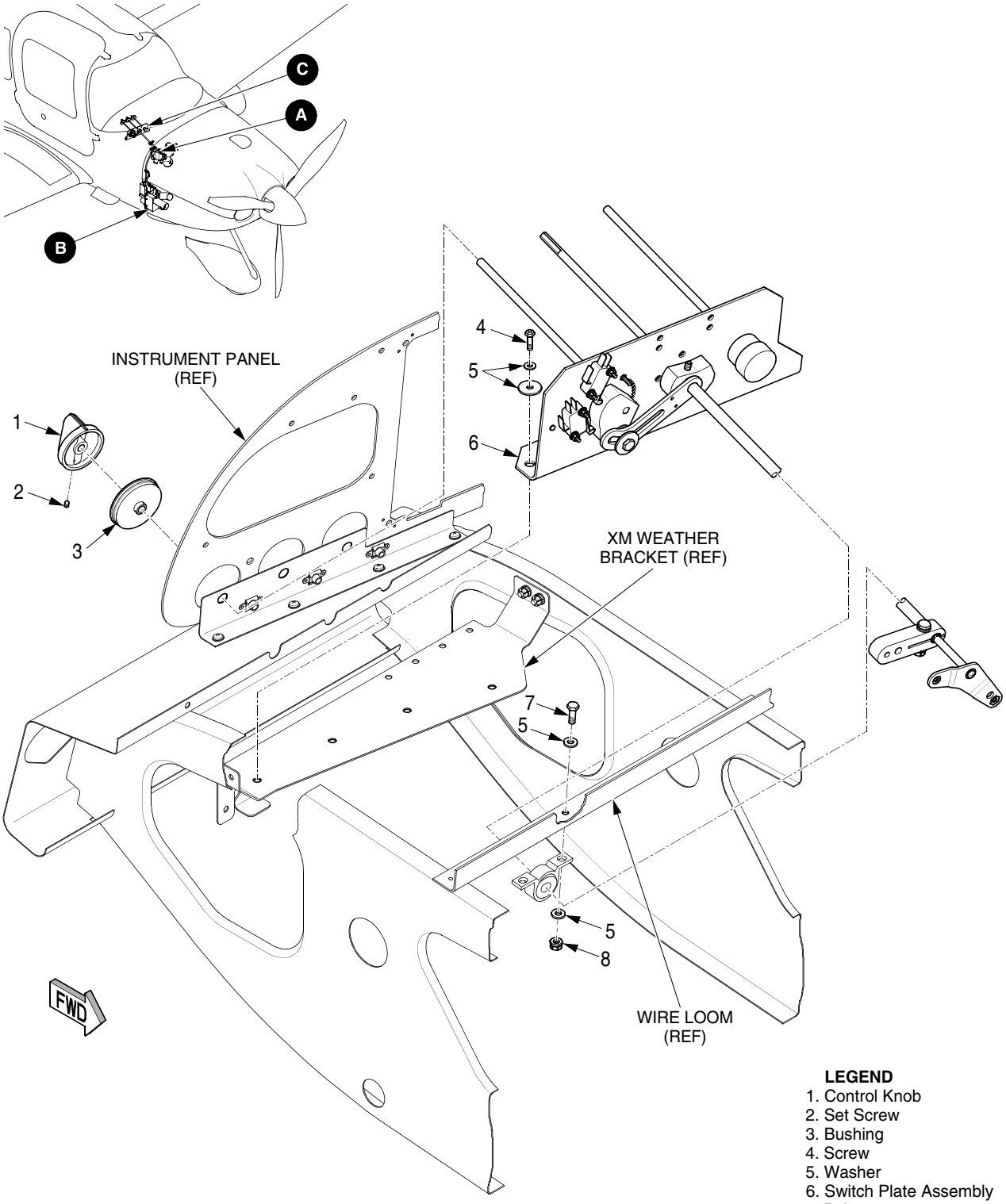
(l) Perform Adjustment/Test - Cabin Air Control Assembly. (Refer to 21-60)

(m) Install RH kick plate. (Refer to 25-10)

(n) Install glareshield. (Refer to 25-10)

(o) Install engine cowling. (Refer to 71-10)

(p) Verify proper operation of temperature controls.

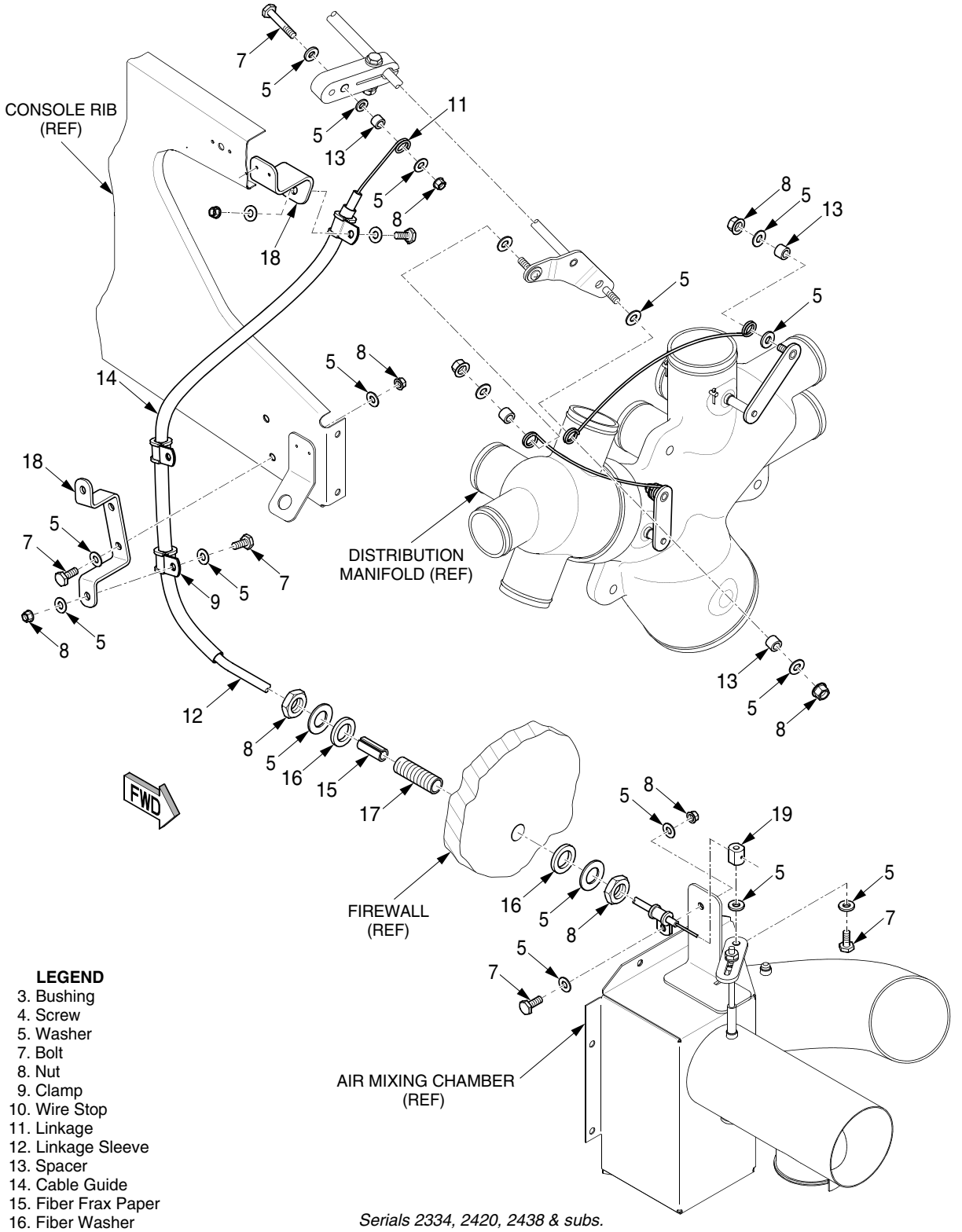


Serials 2334, 2420, 2438 & subs.

DETAIL A

SR22_MM21_2578

Figure 21-606
Cabin Air Control Assembly Installation - Serials 2438 & subs (Sheet 1 of 2)



LEGEND

3. Bushing
4. Screw
5. Washer
7. Bolt
8. Nut
9. Clamp
10. Wire Stop
11. Linkage
12. Linkage Sleeve
13. Spacer
14. Cable Guide
15. Fiber Frax Paper
16. Fiber Washer
17. Cable Pass Through
18. Bracket
19. Wire Stop

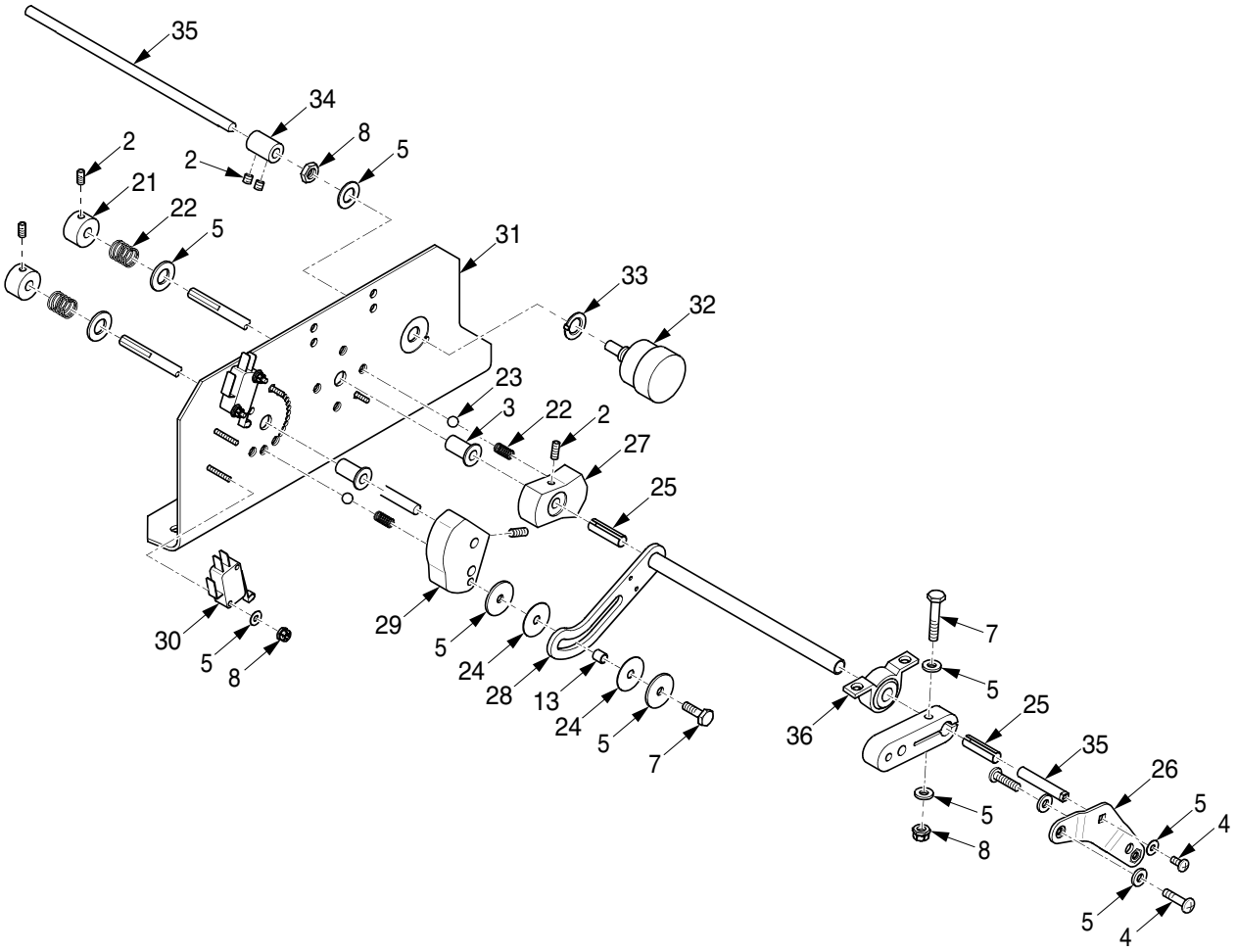
Serials 2334, 2420, 2438 & subs.

DETAIL B

SR22_MM21_2577

Figure 21-606
Cabin Air Control Assembly Installation - Serials 2438 & subs (Sheet 2 of 2)

EFFECTIVITY:
Serials 2438 & subs



LEGEND

2. Set Screw
3. Bushing
4. Screw
5. Washer
7. Bolt
8. Nut
13. Spacer
20. Airflow Control Lever
21. Shaft Collar Assembly
22. Spring
23. Nylon Ball
24. Teflon Washer
25. Nylon Strip
26. Vent Bellcrank
27. Vent Control Cam
28. Temperature Cam Lever
29. Temperature Control Cam
30. Limit Switch
31. Switch Plate
32. Switch
33. Tab Washer
34. Coupler
35. Shaft
36. Bearing

SR22_MM21_2583

Serials 2334, 2420, 2438 & subs.

DETAIL C

Figure 21-606
Cabin Air Control Assembly - Serials 2438 & subs

I. Control Assembly Switches - *Serials 1863 & subs w/ Fan or Air Conditioning* (See Figure 21-603)

(1) Removal - Control Assembly Switch

(a) Set BAT 1, BAT 2, and AVIONICS switches to OFF positions.

(b) Pull COMPRESSOR/CONTROL PANEL circuit breaker.

(c) Remove glareshield. (Refer to 25-10)

(d) Disconnect wire harness connectors from switch.

(e) Remove nuts and washers securing switch to switch plate.

(2) Installation - Control Assembly Switch

(a) Position switch to switch plate and secure with washers and nuts.

(b) Connect wire harness connectors to switch.

(c) Rotate control knobs through all positions, ensuring switches engage as appropriate for selected function.

(d) Install glareshield. (Refer to 25-10)

(e) Reset COMPRESSOR/CONTROL PANEL circuit breaker.

EFFECTIVITY:
Serials 1863 & subs w/ Fan or Air Conditioning

J. Relays - *Serials 1863 & subs w/ Fan or Air Conditioning* **(See Figure 21-607)**

(1) Removal - Relays

(a) Set BAT 1, BAT 2, and AVIONICS switches to OFF positions.

(b) Pull CONDENSER circuit breaker.

(c) Pull COMPRESSOR/CONTROL circuit breaker.

(d) Pull FAN circuit breaker.

(e) Remove MFD. (Refer to 31-60)

(f) Remove relay from relay socket.

(2) Installation - Relays

(a) Position relay to relay socket and press firmly to secure.

(b) Install MFD. (Refer to 31-60)

(c) Reset CONDENSER circuit breaker.

(d) Reset COMPRESSOR/CONTROL circuit breaker.

(e) Reset FAN circuit breaker.

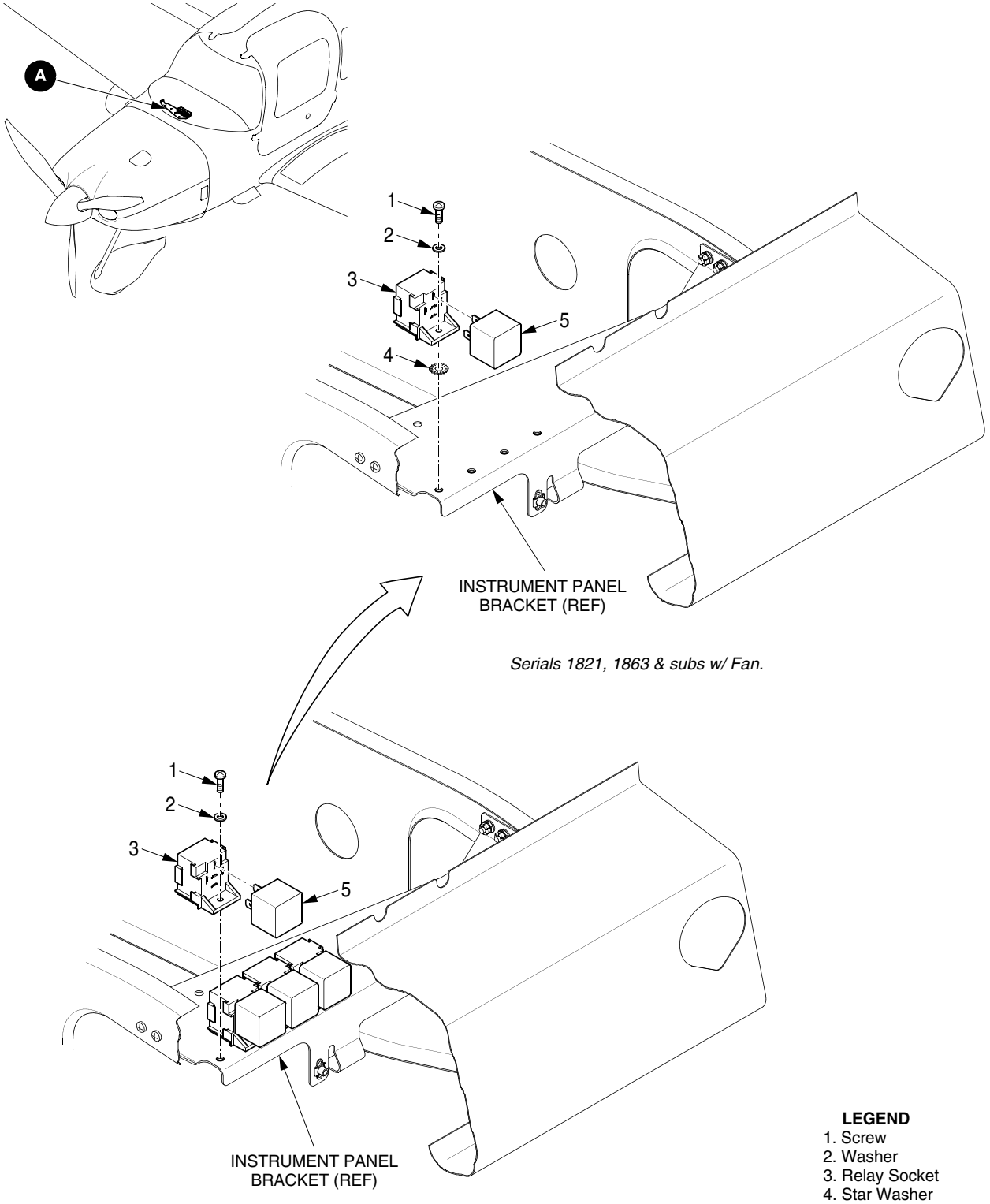


Figure 21-607
Relay Installation - Serials 1863 & subs w/ Fan or Air Conditioning

EFFECTIVITY:
Serials 1863 & subs w/ Fan or Air Conditioning