

PROPELLER (HARTZELL) - INSPECTION/CHECK

1. General

- A. This section has the inspections and checks necessary to keep the Hartzell propeller in a serviceable condition.

NOTE: For different views of the propeller and the spinner installation that are not included in this section, refer to Figure 201, in Propeller (Hartzell) - Maintenance Practices.

TASK 61-10-00-720

2. Hartzell Composite Propeller Functional Check

A. General

- (1) This section gives the information needed to do the functional check of the Hartzell composite propeller.

B. Special Tools

- (1) Mild Soap and Water.
- (2) Age Master No. 1.
- (3) ICEX.
- (4) Stoddard Solvent or equivalent.
- (5) Isopropyl Alcohol.

C. Access

NOTE: The propeller spinner is removed after the propeller is washed for the inspection.

- (1) Remove the nose cap to get access to the propeller governor. Refer to Chapter 71, Engine Cowling and Nose Cap - Maintenance Practices.
- (2) Remove the upper left cowling door to get access to the overspeed governor. Refer to Chapter 71, Engine Cowling and Nose Cap - Maintenance Practices.

D. Do the Hartzell Composite Propeller Detailed Inspection.

CAUTION: Moisture of any type must never touch exposed Kevlar composite material.

- (1) Examine the propeller blades for any openings in the Kevlar composite material before you wash the blades.
 - (a) If you find openings in the Kevlar composite material, apply paint to the exposed areas. Refer to Composite Propeller - Cleaning/Painting.
- (2) Wash the propeller blades and the boots with mild soap and water before you start the inspection.
 - (a) Do not let the soap solution come into contact with the blade clamps.
- (3) Put a mark on the spinner and the bulkhead to record the alignment for the next installation.
 - (a) Do not use a lead pencil.
- (4) Remove the propeller spinner. Refer to Propeller (Hartzell) - Maintenance Practices.
- (5) Be careful to not remove the spinner index mark when you clean the spinner and the bulkhead.
 - (a) Clean the spinner and the bulkhead with Stoddard solvent to remove all grease before you start the inspection.
- (6) Clean the slip ring and the deice brush block with isopropyl alcohol, Stoddard solvent, or equivalent.

E. Examine the Spinner and the Bulkhead.

- (1) Examine the accessible surface of the bulkhead and the inner and outer spinner surface for condition, cracks, corrosion, and fractures.
- (2) Examine the spinner bulkhead, spinner bulkhead support, spinner attach screws, and spinner attach nutplates for condition, corrosion, and wear.
- (3) Examine the attach holes in the spinner for cracks and hole elongation.
- (4) Examine the balance weights for condition, corrosion, security, and correct installation. Refer to Final Weight Installation found in Propeller (Hartzell) - Adjustment/Test.
- (5) Visually examine the spinner dome surface and the bulkhead for burned spots, pits, or other signs of a lightning strike.
 - (a) If there are signs of a lightning strike, refer to Chapter 5, Unscheduled Maintenance Checks, Lightning Strike.
- (6) Examine the attach screws for condition. Make sure that there is a fiber washer installed on each attach screw.

(7) Examine the viewable area of the engine propeller shaft seal just aft of the spinner bulkhead for leaks and condition.

F. Examine the Blades.

- (1) Examine all blades for condition, gouges, scratches, leading edge looseness, erosion, debonds, delaminations, cracks, and exposed composite materials.
- (2) If installed, examine the anti-ice boots for abrasions, exposed heating elements, cuts, nicks, and security of attachment. Refer to Chapter 30, Propeller Anti-Ice - Maintenance Practices, Figure 201.
 - (a) Examine the wiring from the boots to the terminal strips on the spinner bulkhead for condition, chafing, correct routing, and security of attachment at all clamps.
 - (b) Examine the connector between the boot and the wire harness for security of attachment.
 - (c) Examine the wire harness connectors at the terminal strips for condition and security of attachment.
 - (d) Examine the boot edge dressing for condition.
 - 1 If necessary, touch-up damaged or exposed areas.
- (3) Examine the terminal strips for condition and security of attachment to spinner bulkhead.
- (4) Use the "Coin Tap" procedure to examine for debond damage adjacent to any crack in the paint between the erosion shield and the composite material. Refer to the Hartzell Propeller Owners Manual 146, Maintenance Practices.

NOTE: Paint cracks can occur along the line at which the erosion shield contacts the blade surface. Any crack in the paint of a composite blade finish is considered minor damage. Circumferential cracks can occur in the paint and the resin on the primary retention windings because of resin build-up during manufacture. Refer to the Hartzell Propeller Owners Manual.
- (5) Examine the blades and the blade clamps for condition, cracks, corrosion, evidence of lightning strikes, and security. Make sure that all hardware is correctly safetied.

NOTE: Lightning strike damage normally shows by burned spots on the blade clamps and the leading and trailing edges of the blades.

 - (a) If there are signs of a lightning strike, refer to Chapter 5, Unscheduled Maintenance Checks, Lightning Strike.
- (6) Examine all blade clamp counter weights for condition and security.
- (7) Examine all blade clamp static balance weights (if installed) for condition and security.
- (8) Examine the red alignment marks on the blades and the clamps to make sure that the blades have not slipped in the blade clamps.
- (9) Move the counterweights back and forth to examine if there is freedom of blade movement on the hub pilot tube.
- (10) If the blade(s) are possibly tight (will not turn slightly), remove the link arm(s) from servo piston and turn each blade individually with your hand.

CAUTION: Make sure that you do not scratch or damage the link arms.

NOTE: Examine the blades for play. Radial play must not be more than 0.5 degrees. End play and fore and aft movement cannot be more than +/- 0.06 (1.5 mm).
- (11) If the blade(s) are tight, rough, or binding, return the propeller to an approved repair facility.
- (12) If the blades are serviceable, connect the link arms.
- (13) Lubricate the blade clamps. Refer to Chapter 12, Propeller (Hartzell) - Servicing.

G. Examine the Hub (Refer to Figure 601).

CAUTION: Oil leaks from the propeller or the engine can get on the wing, wing struts, and/or the horizontal stabilizer deice boots and cause damage.

- (1) Examine the exposed area for condition, cracks, corrosion, and security of the components to the hub.
- (2) Visually examine all three link arms for condition and security.
- (3) Examine the hub servo piston and the blade clamps for oil and grease leaks.
- (4) Visually examine the propeller for security of installation.

NOTE: If the safety wire installation is correct, the propeller is secured.
- (5) Examine the exterior area of the servo piston for condition, corrosion, and security of the flex lock nut.

NOTE: The flex lock nut installation is correct if the torque putty on nut and the shaft is not broken.

- H. Examine the Beta Feedback Ring (Refer to Figure 601).
- (1) Examine the feedback ring for condition, corrosion, and security of installation.
 - (2) Clean the feedback ring and the brush holder with isopropyl alcohol, Stoddard solvent, or equivalent.
 - (3) Examine the wires between the feedback ring and the terminal strip for condition, chafing, and security.
 - (4) Examine the reversing lever for condition and security.
 - (5) Examine the reversing lever for free play.
 - (a) If there is free play at the beta valve, remove the bolt and examine the sleeve bushing for signs of wear at the attach location.
 - 1 If there is wear, replace the bushing.
 - (b) If the lever has free play at the beta cable clevis, remove bolt at the clevis and examine the sleeve spacer for signs of wear at the attach point.
 - 1 If there is wear, replace the spacer.
 - (6) Examine the carbon brush for wear and signs of damage.
 - (7) To examine the carbon brush for wear, do the steps that follow:
 - (a) Hold the carbon brush against the feedback ring.
 - (b) Turn the feedback ring and measure the clearance between the carbon brush and the feedback ring around the full circumference of the feedback ring.

NOTE: The clearance between the brush and the feedback ring must not be more than 0.010 inch (0.254 mm) at any area around the full circumference of the ring.
- CAUTION:** Do not turn the elastic low pitch stop nuts installed on the low pitch stop rods.
- (8) Examine the low pitch stop rods (3 each) for condition and security.
 - (a) The low pitch stop rod locknuts are installed correctly if the torque putty has not been disturbed.
 - (9) Examine the varistor installed near the center at the top of the forward side of the firewall for condition and security of installation.
 - (10) Examine the electrical connections for condition, routing, signs of chaffing, and security.
 - (11) Discoloration of the varistor or the electrical leads, or a failure can be a sign that a lightning strike has occurred.
 - (a) If you think that there was a lightning strike to the airplane, refer to Chapter 5, Unscheduled Maintenance Checks, Lightning Strike.
 - (12) Apply Age Master No. 1 to the de-ice boots in accordance with the manufactures recommendations. Refer to Chapter 30, Pneumatic Surface Deice - Maintenance Practices.
 - (13) If the operating conditions make it necessary, apply ICEx II to the boots. Refer to Chapter 30, Pneumatic Surface Deice - Maintenance Practices.
- I. Examine the Propeller Governor (Refer to Figure 601).
- (1) Examine the propeller governor for condition, oil leaks, and security.
 - (2) Examine the speed adjuster return spring for condition and security.
 - (3) Examine the air bleed link for corrosion, condition, and security.
 - (4) Examine the governor interconnecting rod for corrosion, condition, security and wear.
 - (a) Make sure that the rod end bearings turn freely and do not bind.
 - (5) Examine all hardware for corrosion, condition, and correct safety.

NOTE: It is not necessary to safety wire the four self locking mounting nuts.
- J. Examine the Propeller Cable Terminal Rod End (Refer to Chapter 76, Quadrant Assembly and Controls - Maintenance Practices, Figure 202).
- (1) Disconnect the rod end from the propeller speed adjusting lever. Refer to Propeller Control - Maintenance Practices.
 - (2) Wipe the rod end clean using a clean lint-free cloth.
 - (3) Examine the rod end for corrosion, pitting, and cleanliness.
 - (4) Lubricate the rod end ball with MIL-L-7870.

- (5) Connect the rod end to the adjusting lever. Refer to Propeller Control - Maintenance Practices.
- K. Examine the Overspeed Governor (Refer to Propeller Control - Maintenance Practices, Figure 201).
- (1) Examine the overspeed governor for condition, oil leaks, and security.
 - (a) Make sure that the hardware is safety wired except for the four self-locking attach nuts.
 - (2) Examine the electrical wiring and the electrical connector at the governor reset test solenoid for signs of damage, correct wire routing, and security.
 - (3) Examine the governor reset test solenoid for condition and security.
 - (4) Install the upper left cowling door. Refer to Chapter 71, Engine Cowling and Nose Cap - Maintenance Practices.
 - (5) Install the nose cap. Refer to Chapter 71, Engine Cowling and Nose Cap - Maintenance Practices.
 - (6) Install the propeller spinner. Refer to Propeller (Hartzell) - Maintenance Practices.
 - (7) Do the Propeller Overspeed Governor Functional Check. Refer to Propeller Control - Maintenance Practices.

L. Restore Access

NOTE: The propeller spinner, nose cap, and upper left cowling door were installed before the functional check.

- (1) None

END OF TASK

TASK 61-10-00-721

3. Hartzell Aluminum Propeller Functional Check

- A. For information on the inspection procedures required for the Hartzell aluminum propeller, refer to the Hartzell Propeller Owner's Manual No. 139. Refer to the Introduction, List of Publications in this manual.

END OF TASK

Figure 601 : Sheet 1 : Propeller and Spinner Installation - Hartzell

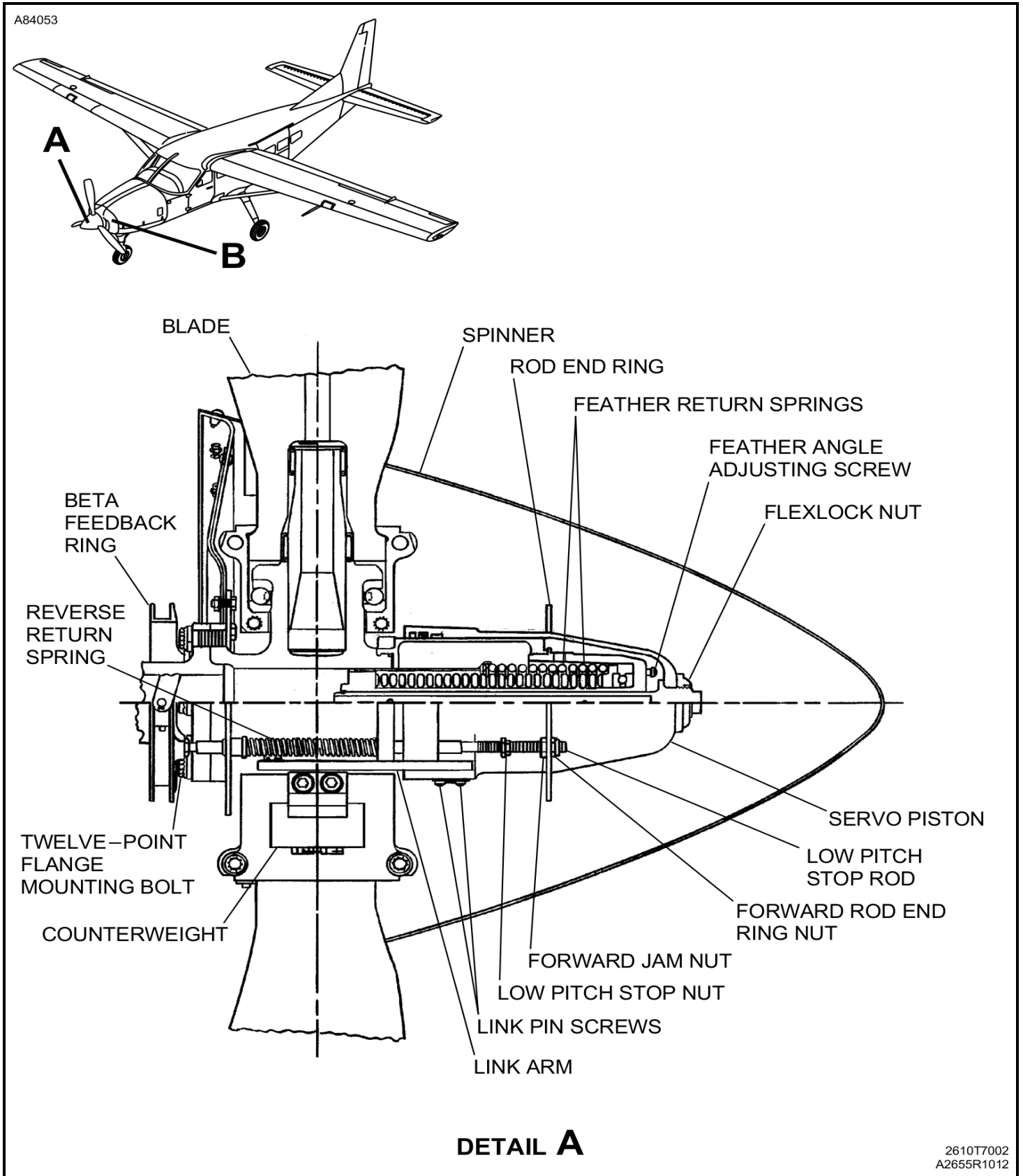


Figure 601 : Sheet 2 : Propeller and Spinner Installation - Hartzell

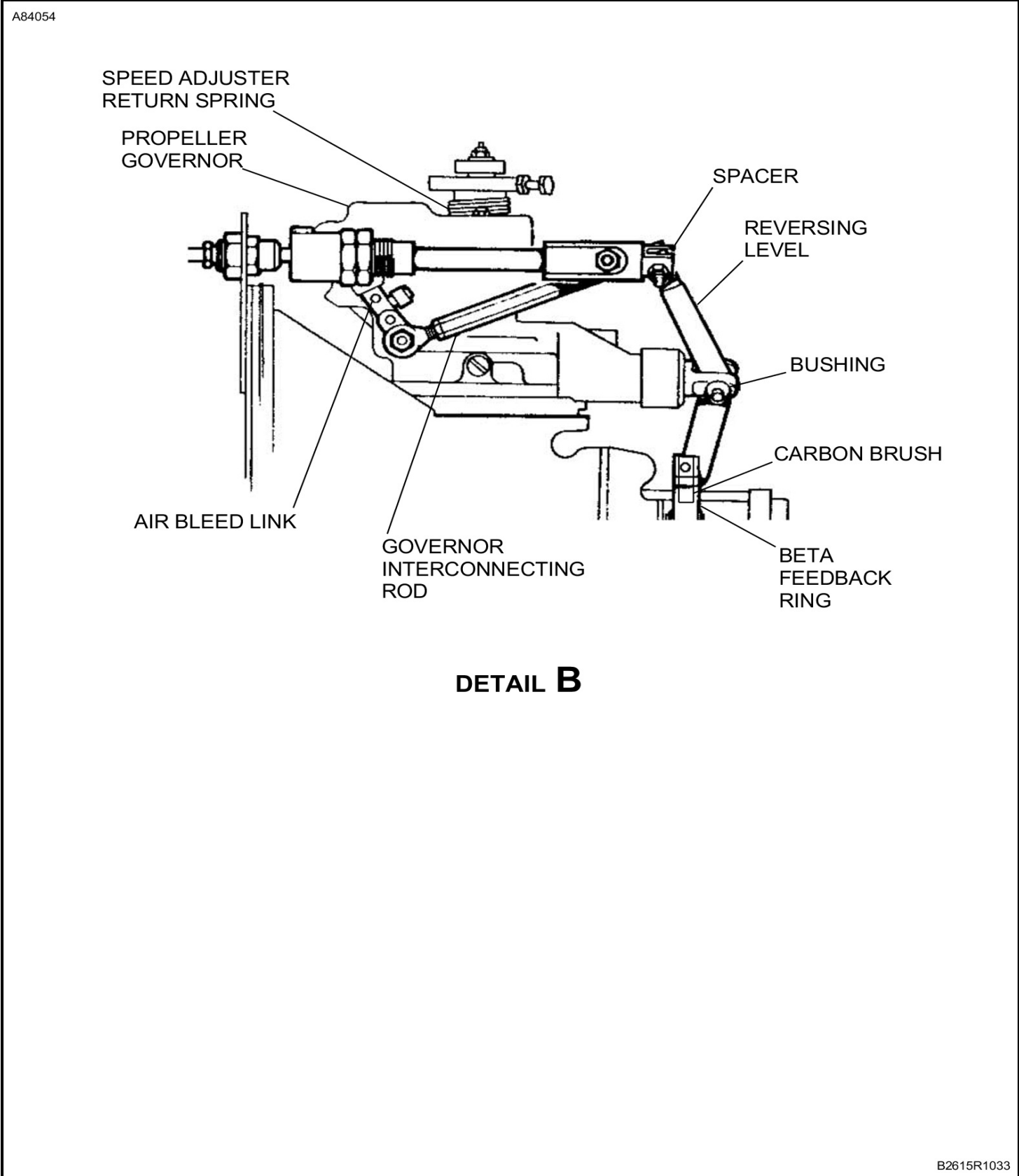


Figure 201 : Sheet 1 : Hartzell Propeller Installation

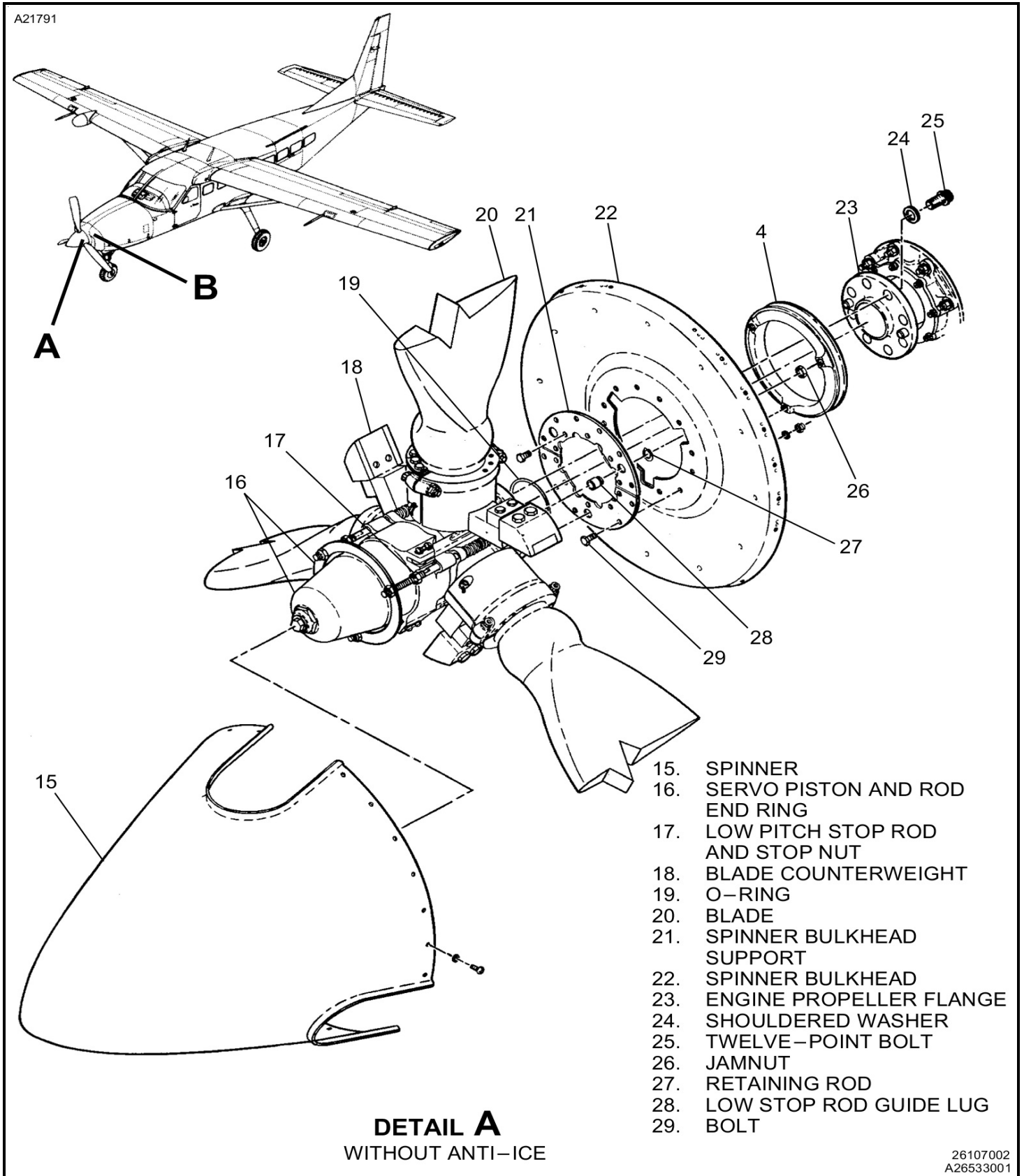
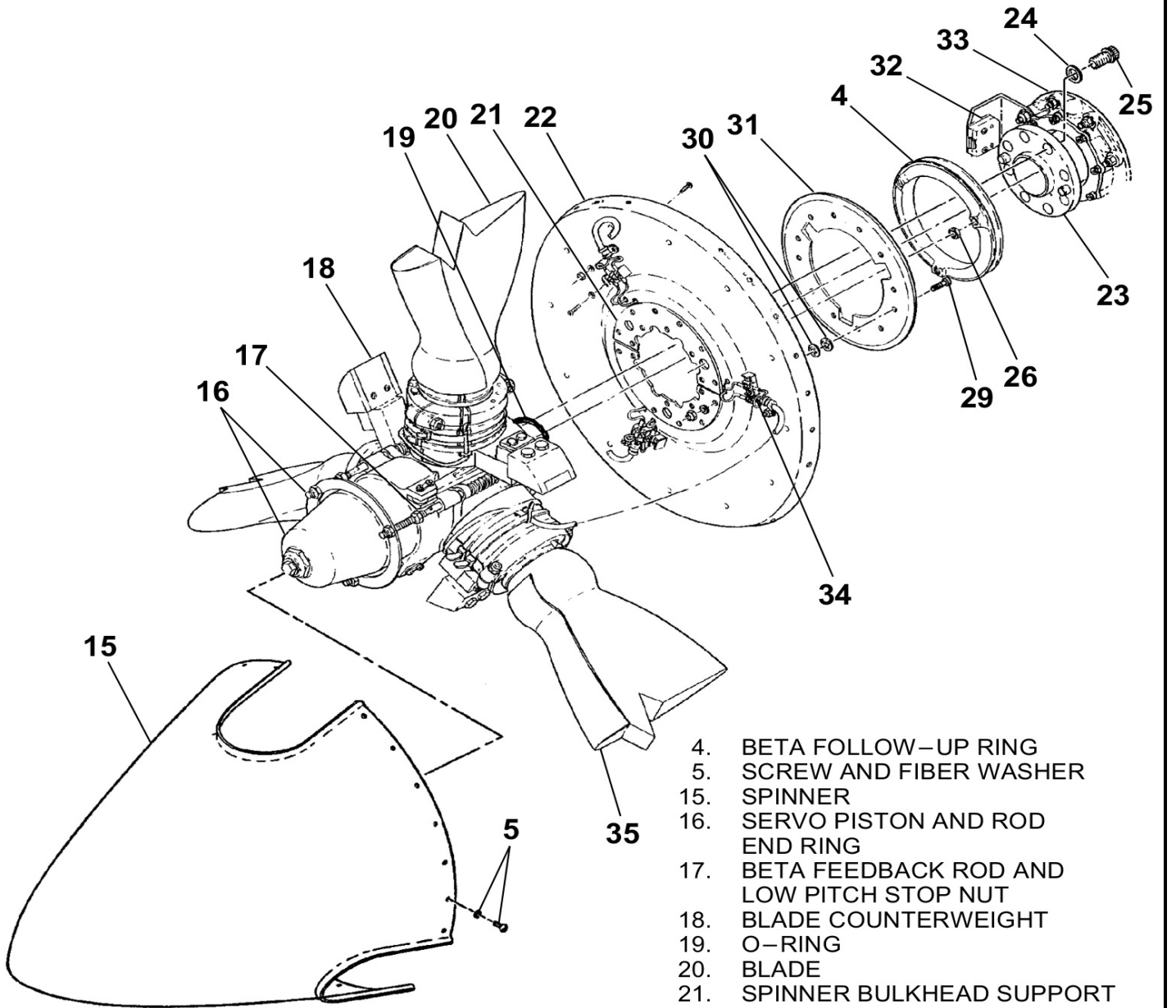


Figure 201 : Sheet 2 : Hartzell Propeller Installation

A21792

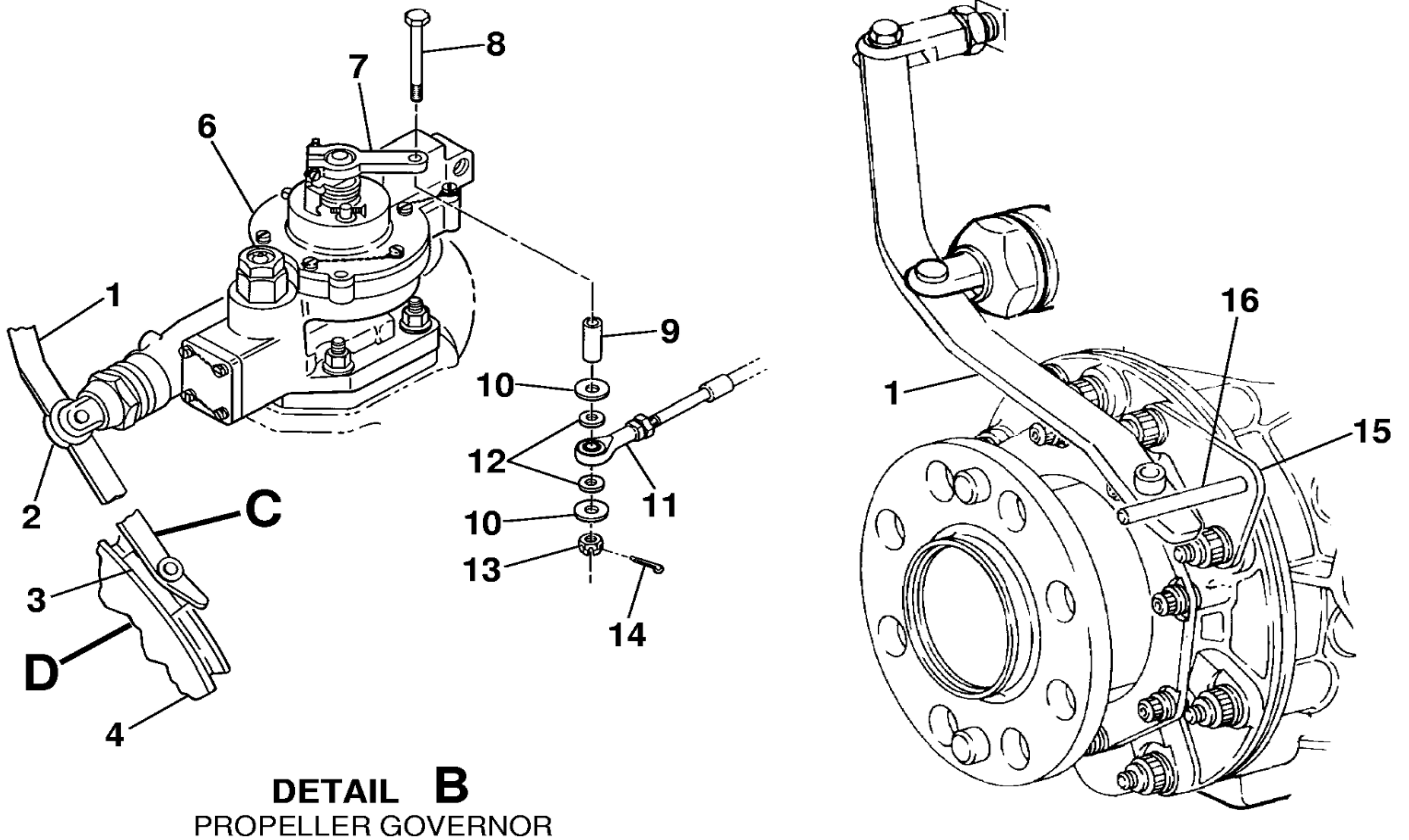


- 4. BETA FOLLOW-UP RING
- 5. SCREW AND FIBER WASHER
- 15. SPINNER
- 16. SERVO PISTON AND ROD
- 17. BETA FEEDBACK ROD AND LOW PITCH STOP NUT
- 18. BLADE COUNTERWEIGHT
- 19. O-RING
- 20. BLADE
- 21. SPINNER BULKHEAD SUPPORT
- 22. SPINNER BULKHEAD
- 23. ENGINE PROPELLER FLANGE
- 24. SHOULDERED WASHER
- 25. TWELVE-POINT BOLT
- 26. JAMNUT
- 29. BOLT
- 30. BELLEVILLE WASHER
- 31. ANTI-ICE SLIP RING
- 32. ANTI-ICE BRUSH HOLDER AND BRUSHES
- 33. ENGINE REDUCTION GEARBOX
- 34. SLIP RING LEAD TERMINAL BLOCK
- 35. ANTI-ICE BOOT

2653R3002

Figure 201 : Sheet 3 : Hartzell Propeller Installation

A21793



DETAIL B
PROPELLER GOVERNOR

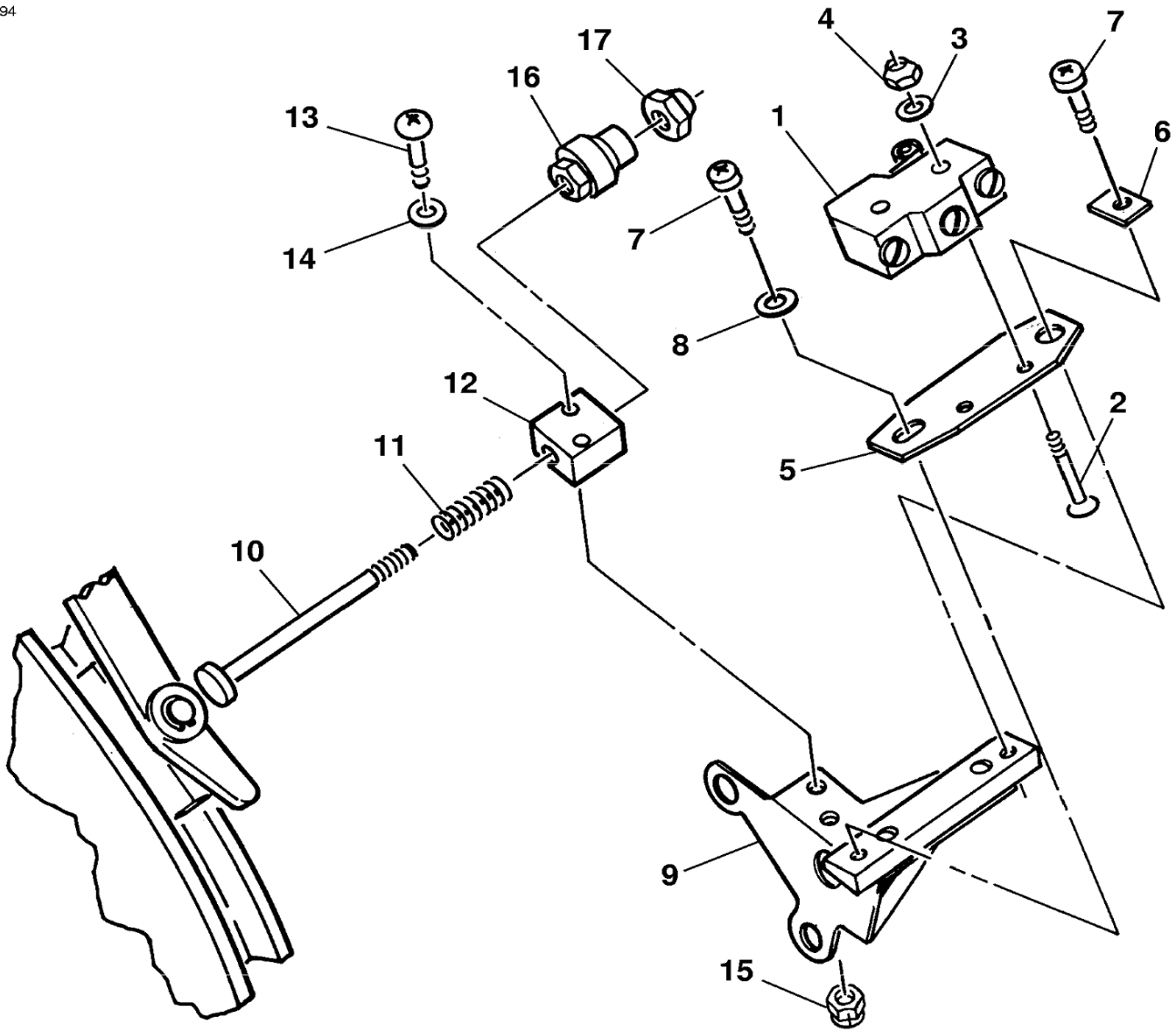
DETAIL C

1. REVERSING LEVER
2. BETA VALVE CLEVIS
3. CARBON BLOCK
4. BETA FOLLOWUP RING
5. SCREW AND FIBER WASHER
6. PROPELLER GOVERNOR
7. PROPELLER SPEED ADJUSTING LEVER
8. BOLT
9. SPACER
10. WASHER
11. SPEED CONTROL CABLE ROD END
12. WASHER
13. NUT
14. COTTER PIN
15. GUIDE PIN BRACKET
16. GUIDE PIN

C26532001
C2655R1040

Figure 201 : Sheet 4 : Hartzell Propeller Installation

A21794



- | | |
|------------------------|-------------|
| 1. BETA SWITCH | 10. PLUNGER |
| 2. SCREW | 11. SPRING |
| 3. NUT | 12. BLOCK |
| 4. WASHER | 13. SCREW |
| 5. PLATE | 14. WASHER |
| 6. AFT PLATE | 15. NUT |
| 7. SCREW | 16. CAM |
| 8. WASHER | 17. JAM NUT |
| 9. BETA SWITCH BRACKET | |

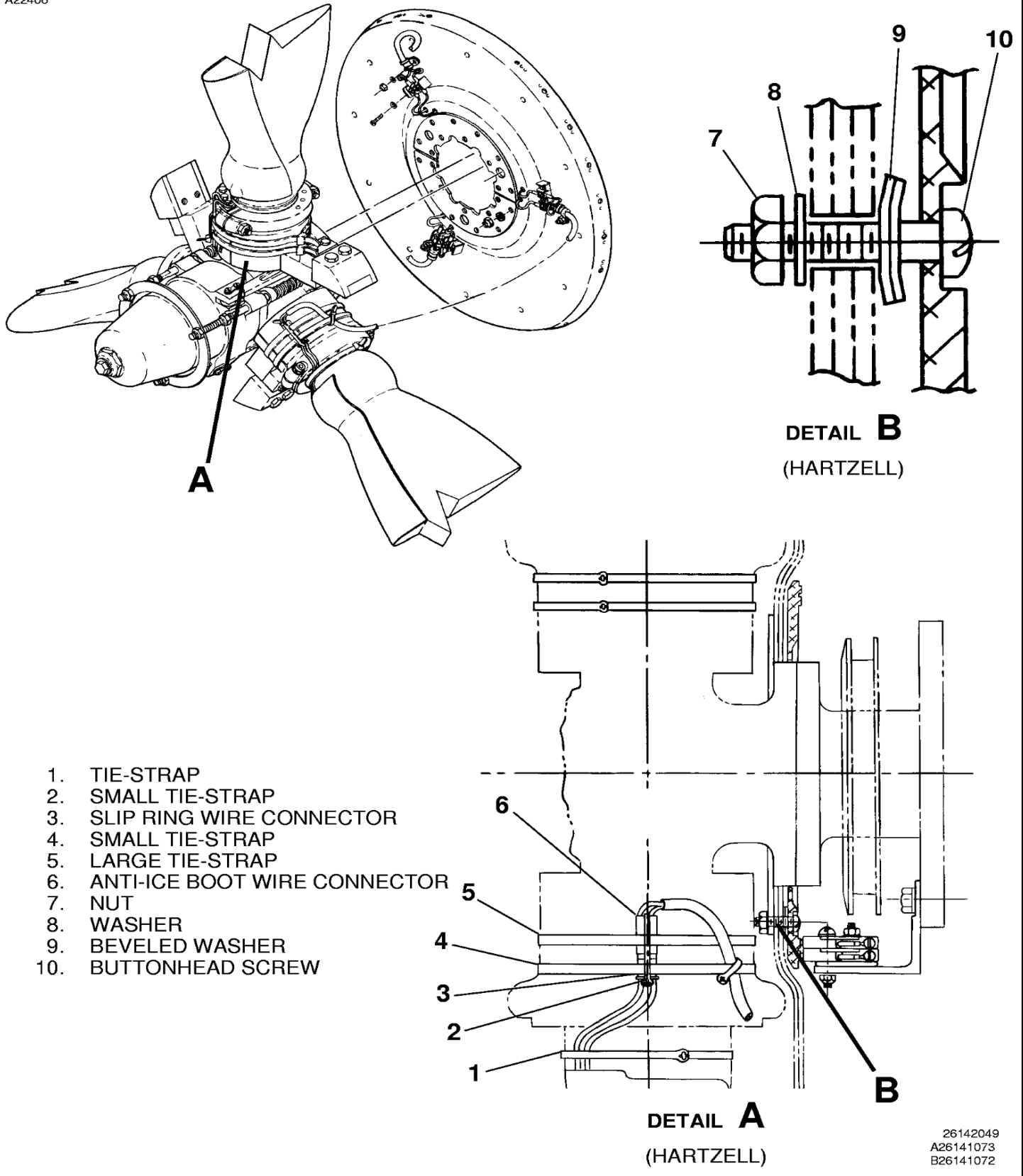
DETAIL D

BRAZILIAN AND BRITISH CERTIFIED AIRPLANES
BETA INDICATING SYSTEM

C59551002A

Figure 201 : Sheet 1 : Propeller Anti-Ice Boots Installation

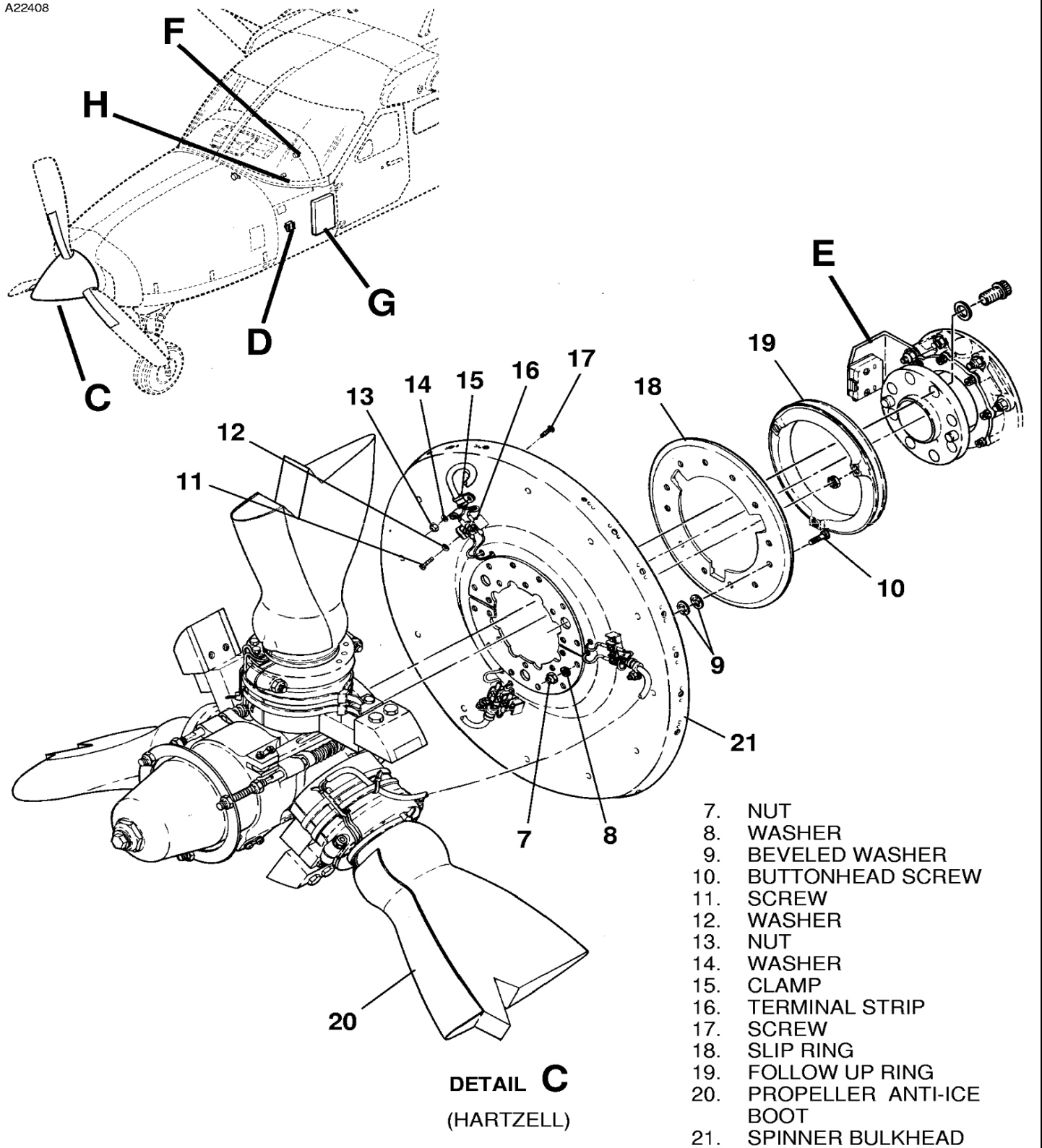
A22406



26142049
A26141073
B26141072

Figure 201 : Sheet 2 : Propeller Anti-Ice Boots Installation

A22408



- 7. NUT
- 8. WASHER
- 9. BEVELED WASHER
- 10. BUTTONHEAD SCREW
- 11. SCREW
- 12. WASHER
- 13. NUT
- 14. WASHER
- 15. CLAMP
- 16. TERMINAL STRIP
- 17. SCREW
- 18. SLIP RING
- 19. FOLLOW UP RING
- 20. PROPELLER ANTI-ICE BOOT
- 21. SPINNER BULKHEAD

26141152
C26142049

Figure 201 : Sheet 3 : Propeller Anti-Ice Boots Installation

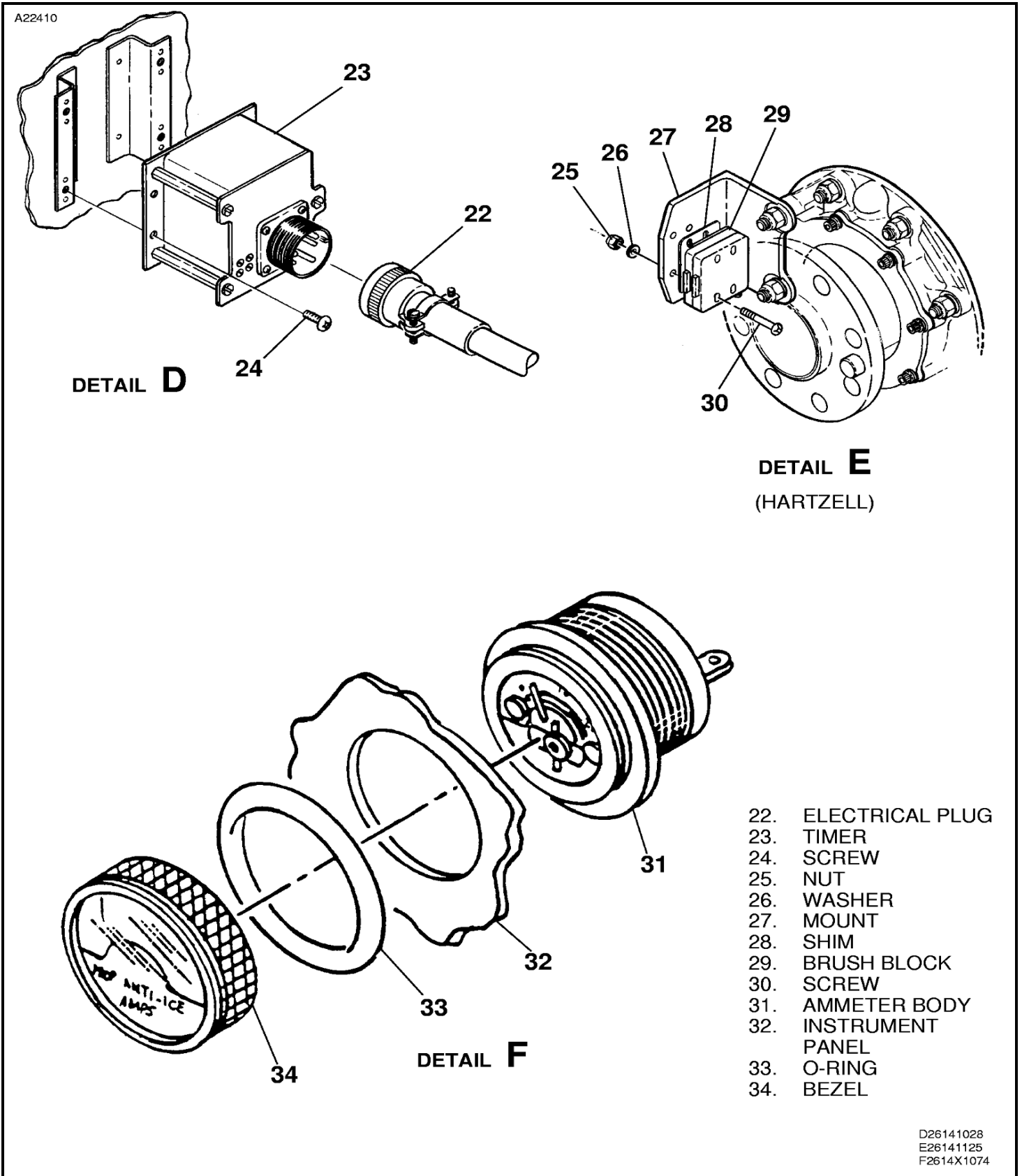
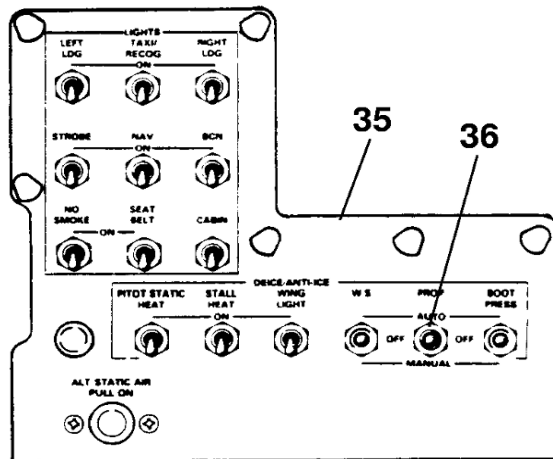
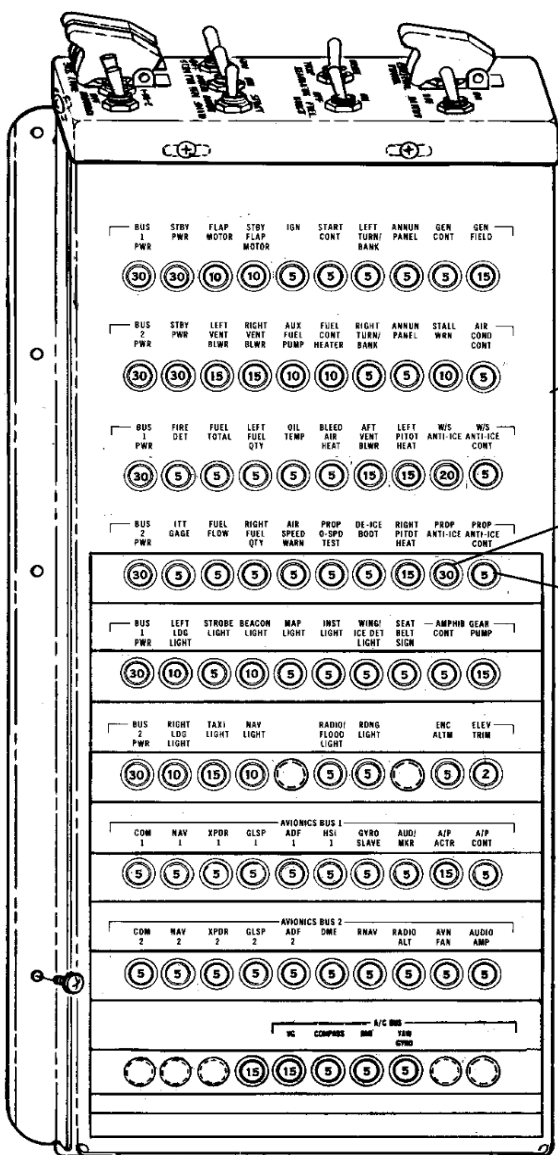


Figure 201 : Sheet 4 : Propeller Anti-Ice Boots Installation

A22411



DETAIL H



DETAIL G

- 37. CIRCUIT BREAKER PANEL
- 38. PROPELLER ANTI-ICE CIRCUIT BREAKER
- 39. PROPELLER ANTI-ICE CONTROL CIRCUIT BREAKER
- 35. DEICE / ANTI-ICE SWITCH PANEL
- 36. PROPELLER ANTI-ICE SWITCH

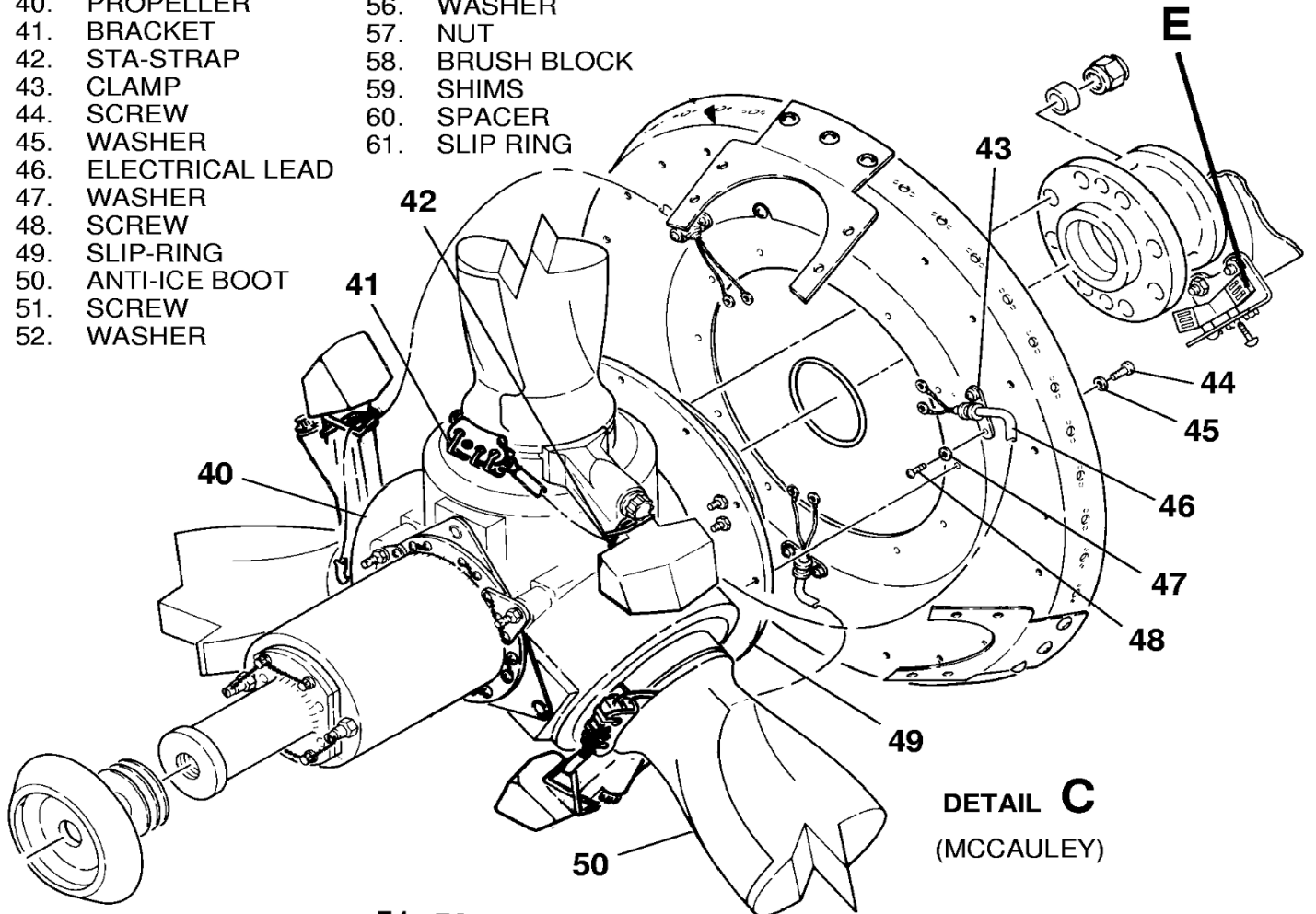
G2618X1094
H26141071

Figure 201 : Sheet 5 : Propeller Anti-Ice Boots Installation

A22413

- 22. ELECTRICAL PLUG
- 23. TIMER
- 24. SCREW
- 40. PROPELLER
- 41. BRACKET
- 42. STA-STRAP
- 43. CLAMP
- 44. SCREW
- 45. WASHER
- 46. ELECTRICAL LEAD
- 47. WASHER
- 48. SCREW
- 49. SLIP-RING
- 50. ANTI-ICE BOOT
- 51. SCREW
- 52. WASHER

- 53. TERMINAL BLOCK
- 54. ELECTRICAL LEADS
- 55. BRACKET
- 56. WASHER
- 57. NUT
- 58. BRUSH BLOCK
- 59. SHIMS
- 60. SPACER
- 61. SLIP RING



DETAIL C
(MCCAULEY)

0.064 INCH,
+0.015 OR
-0.015 INCH

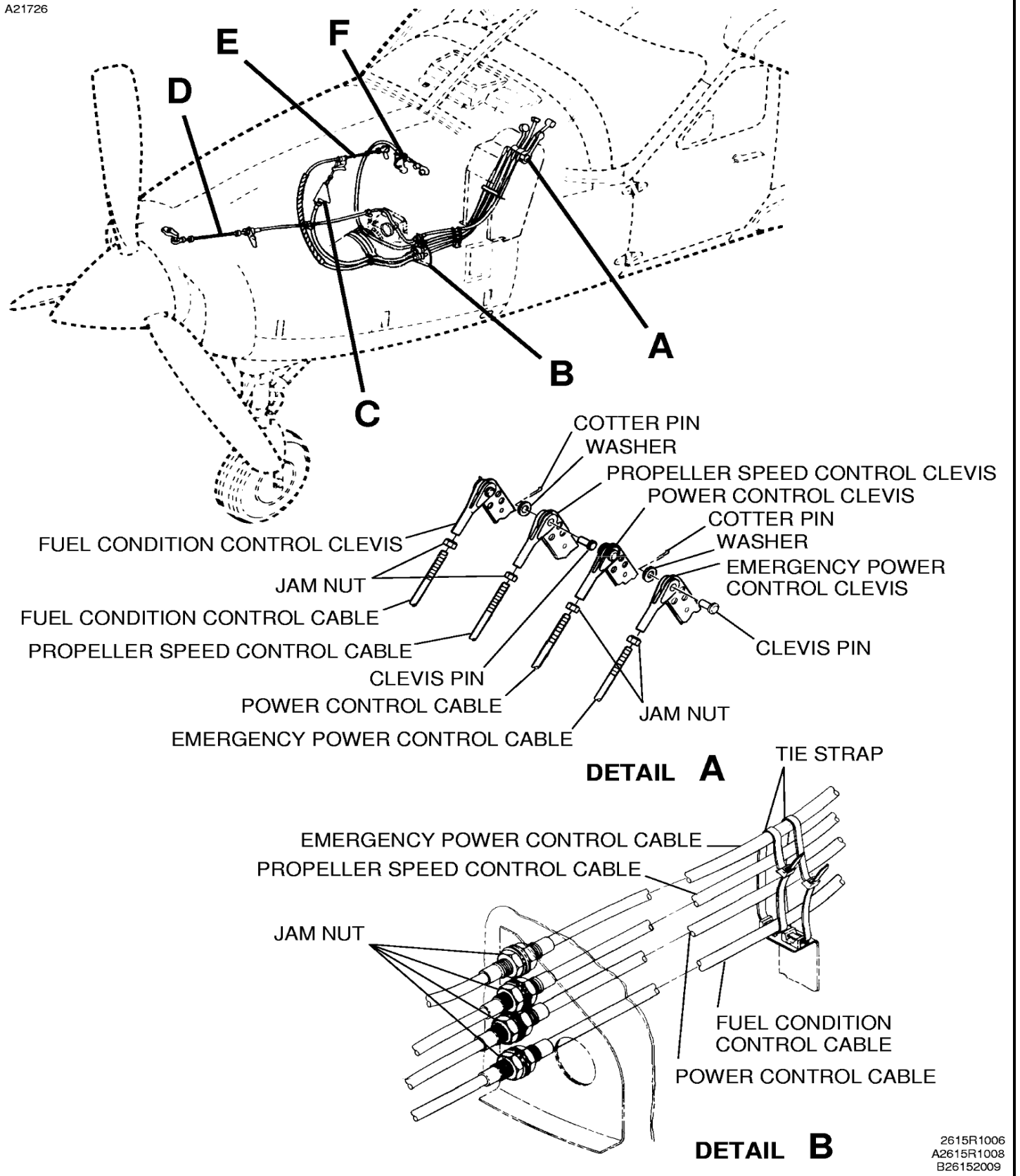
DETAIL E

DETAIL D

C26502001
D26141028A
E2614X1075

Figure 202 : Sheet 1 : Engine Control Cable Installation

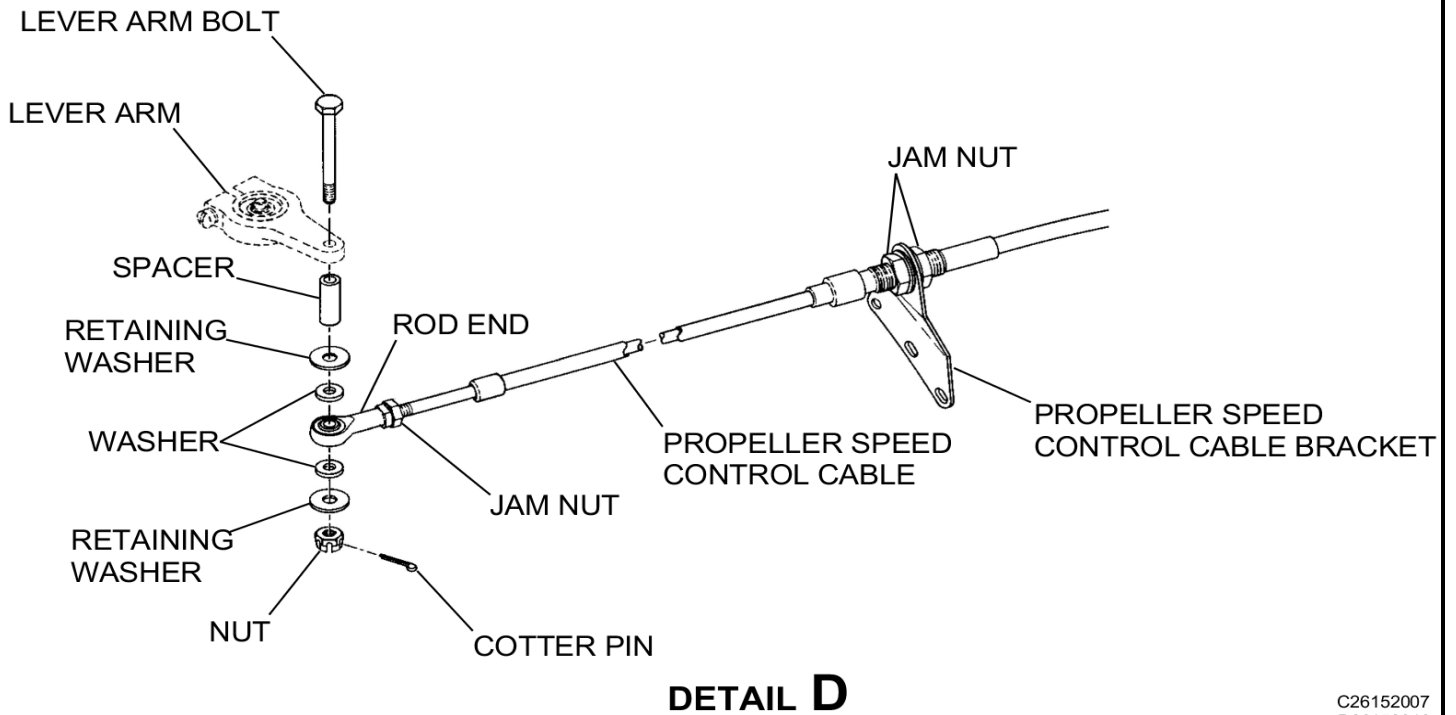
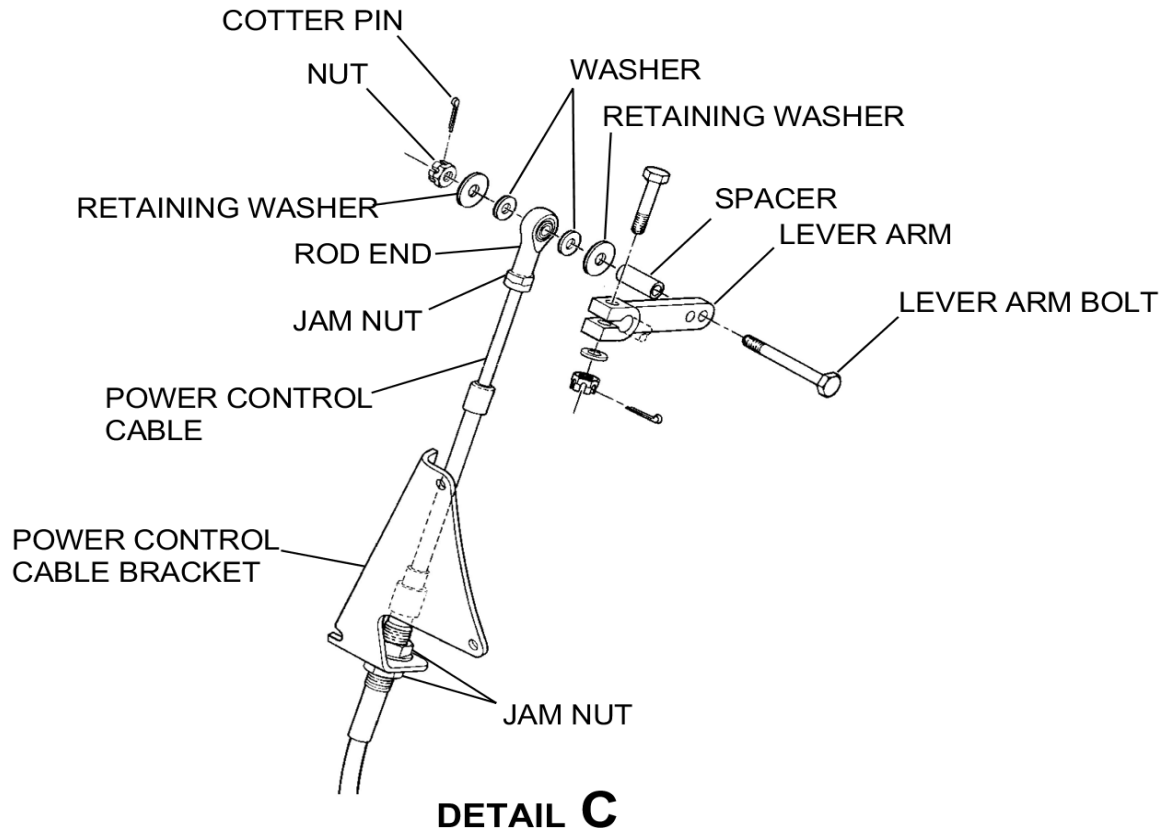
A21726



2615R1006
 A2615R1008
 B26152009

Figure 202 : Sheet 2 : Engine Control Cable Installation

A21727



C26152007
D26152010

Figure 202 : Sheet 3 : Engine Control Cable Installation

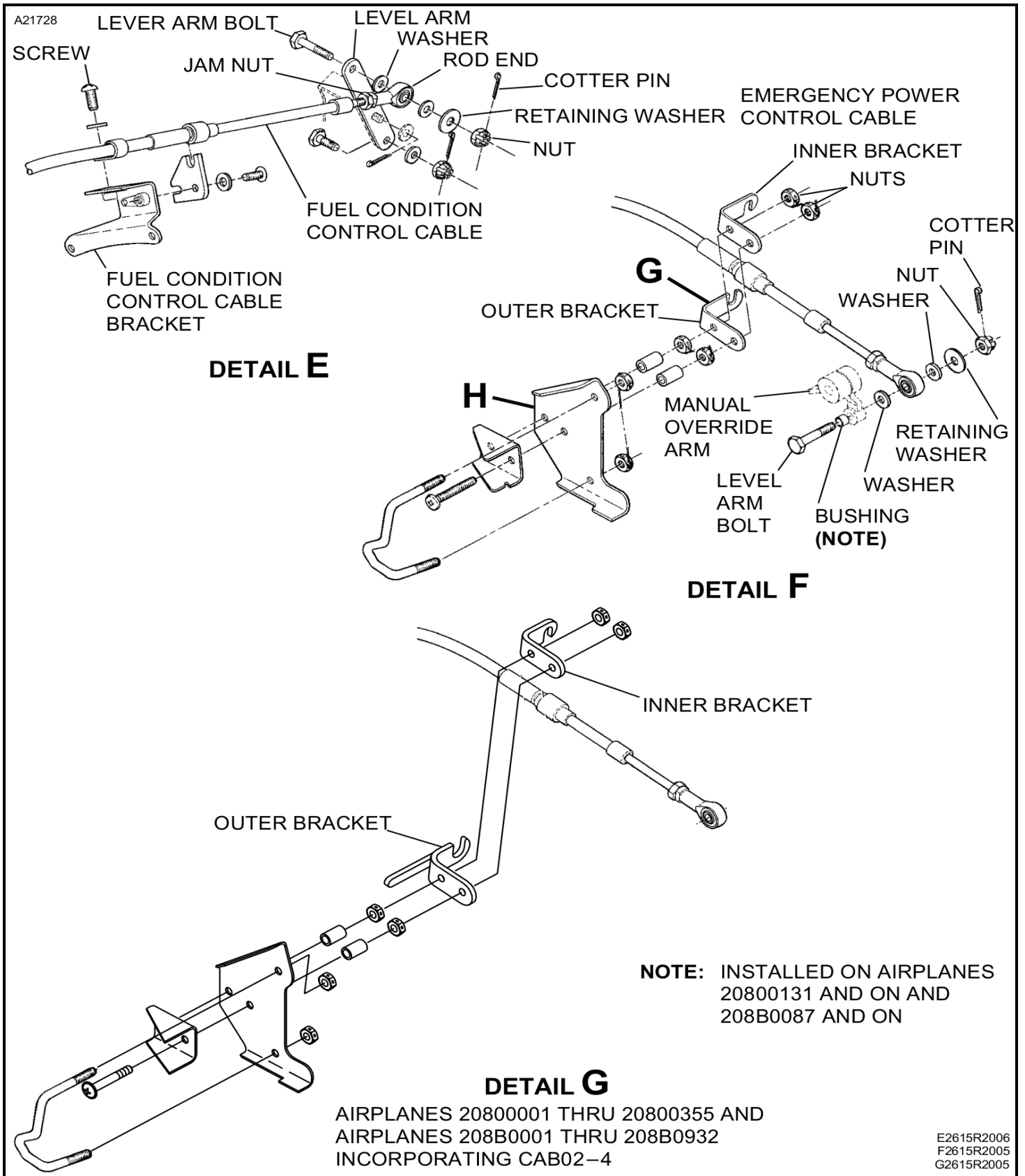


Figure 202 : Sheet 4 : Engine Control Cable Installation

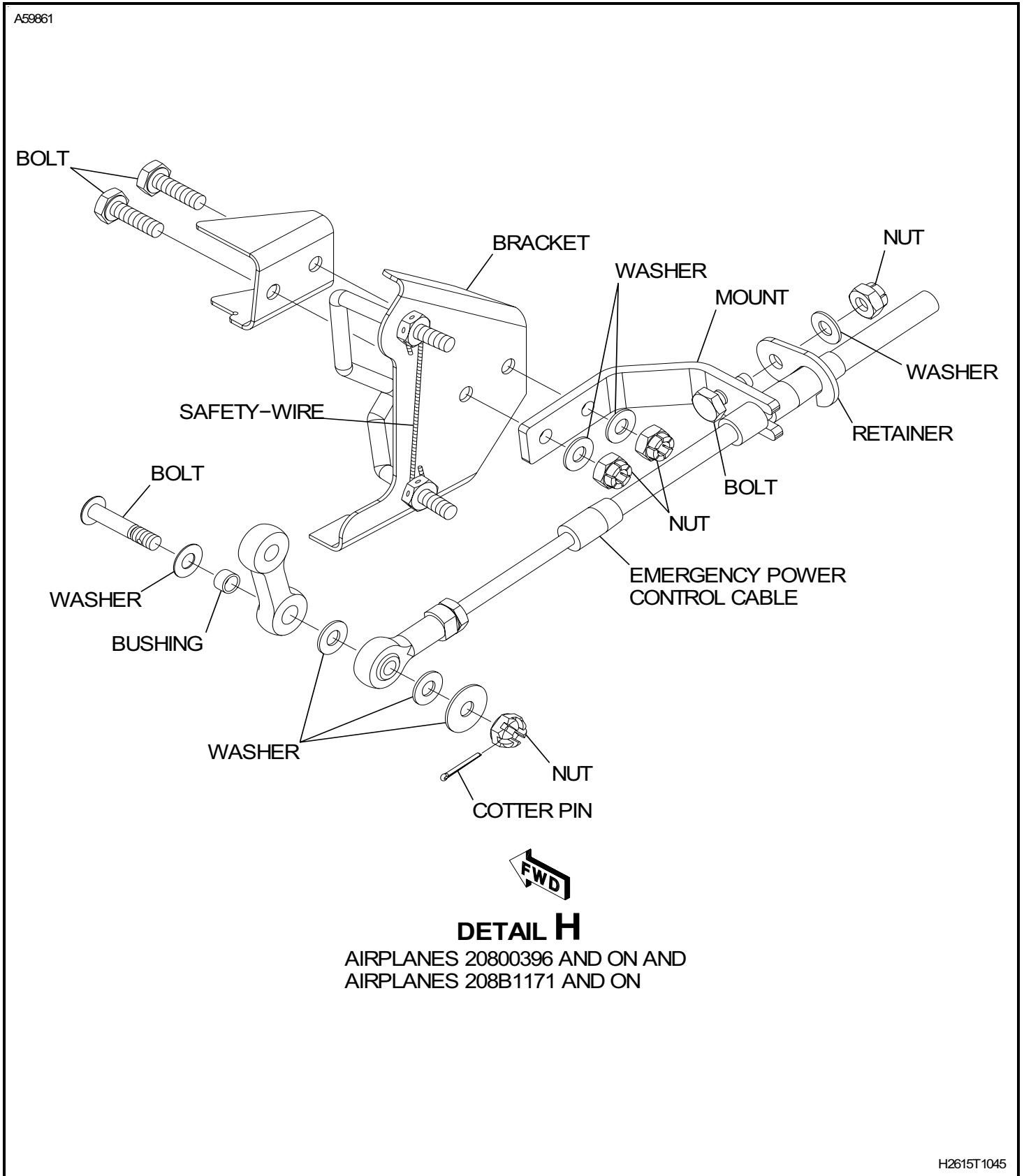


Figure 201 : Sheet 1 : Propeller Overspeed Governor Installation

