R66 MAINTENANCE MANUAL
and
INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
RTR 660 VOLUME I

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PUBLICATIONS

Viewing RHC Maintenance Manuals (MMs) and Illustrated Parts Catalogs (IPCs) online at https://robinsonheli.com/publications is recommended to ensure use of current data. Viewing MMs and IPCs offline via paper or digital download requires verification that the data is current. Refer to the online MM or IPC Revision Log for the list of current pages.

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1-50 Notations

The following notations will be found throughout the manual:

NOTE

A NOTE provides emphasis or supplementary explanation.

CAUTION

Equipment damage can result if a **CAUTION** is not followed.

WARNING

Personal injury or death can result if a WARNING is not followed.

1-55 Maintenance Manual and Illustrated Parts Catalog References

Maintenance Manual and Illustrated Parts Catalog Section and Figure references are subject to relocation and renumeration. Effort will be made at the time of RHC technical document revisions to correct superseded references, however, certain documents may not otherwise require revision and superseded references may remain. A keyword or part number search in online documents (Ctrl + F [PC] or Command + F [Mac]) may help to locate applicable data.

1-60 Definitions and Abbreviations

Refer to R66 Pilot's Operating Handbook (POH) Section 1 for additional definitions and abbreviations.

A. Definitions

14 CFR § 27.602 Critical Part: F016-2 main rotor blades & F029-1 tail rotor blades are critical parts as defined by 14 CFR § 27.602 and are subject to special inspection requirements & reporting described in Chapters 62 & 64. Contact RHC Technical Support if questions arise concerning special inspection or reporting requirements.

12 years: With respect to a 12 year inspection or life-limit, 12 years means 12 years from the date of the:

- factory-issued airworthiness certificate,
- factory-issued authorized release certificate (FAA Form 8130-3, Airworthiness Approval Tag), factory-issued invoice, or
- last 12-year inspection.

15 years: With respect to a 15 year inspection or life-limit, 15 years means 15 years from the date of the:

- factory-issued airworthiness certificate,
- factory-issued authorized release certificate (FAA Form 8130-3, Airworthiness Approval Tag), factory-issued invoice, or
- last 15-year inspection (or last 12-year inspection).

Annually: With respect to an annual inspection, annually means within the preceding 12 calendar months.

Datum: An imaginary vertical plane from which all horizontal measurements are taken for balance purposes with the aircraft in level flight attitude. Refer to § 6-20 for R66 datum location.

Empty Weight: Standard empty weight of a standard helicopter including unusable fuel, full operating fluids, and full engine oil. Basic empty weight is standard empty weight plus weight of installed optional equipment. Refer to R66 Type Certificate Data Sheet (TCDS) R00015LA at: https://drs.faa.gov. Refer to helicopter's Equipment List/Weight and Balance Data Sheet (RF 134) and Weight and Balance Record in R66 POH Section 6 for installed equipment.

Life-Limited Part: Refer to § 4-10.

Time in Service: With respect to maintenance time records, time in service means the time from the moment an aircraft leaves the surface of the earth until it touches it at the next point of landing.

1-80 Assembly Instructions for R66 Helicopter Crated for Export (continued)

10. For air-conditioned ships:

    a. Refer to Figure 1-1. Remove shipping supports (ty-raps, foam, tape, etc.) from G777-1 compressor assembly. Install hardware securing G782-1 mount weldment to main rotor gearbox. Standard torque hardware per § 20-32 and torque stripe per Figure 5-1. Hook B774-3 spring in drilled hole of NAS1352-4H14 screw. Verify security.

    b. Refer to Figures 1-1 and 1-2. Verify B173-5 V-belt is in good condition. Fit belt around G779-1 pulley and compressor pulley, and install hardware securing compressor to G782-1 mount weldment. Standard torque bolts per § 20-32.

    c. Refer to Figure 1-2. Install hardware securing compressor to G781-1 arm weldment. Rotate compressor up and outboard to tension belt, then tighten hardware securing compressor to weldment. Verify belt is properly aligned on both pulleys. Adjust belt tension until 4.5-5.5 lb of force applied mid-span deflects belt 0.16-inch. Standard torque bolts per § 20-32.

    d. Connect compressor assembly wiring to airframe harness at connectors and install ty-raps as required. Cinch ty-raps until snug without over-tightening, and trim tips flush with heads.

11. Refer to IPC Figure 79-1. Remove F237-1 tailcone frame weldment and F305-5 (aft) inlet. Install tail rotor drive fan shaft (fanwheel installed) through scroll assembly. Install hardware securing aft inlet to scroll assembly. Verify security.

12. Refer to IPC Figure 65-1. Install hardware securing C947-3 plate assembly to F908-1 yoke and tail rotor drive fan shaft. Standard torque bolts and stamped nuts per § 20-32 and torque stripe per Figure 5-1.

13. Remove shipping supports (ty-raps, foam, tape, etc.) from tailcone assembly, and install tailcone per § 53-40 steps 1 thru 7. Install strobe light. Install communication and GPS antennas (if equipped).

14. Install empennage assembly per § 53-70. Install horizontal stabilizer assemblies per §§ 53-60 & 53-80.

15. Service tail rotor gearbox per § 12-21. Service main rotor gearbox per § 12-11.

16. Remove hydraulic reservoir shipping plug. Install D487-3 vent assembly, special torque vent to 100 in.-lb, and torque stripe per Figure 5-1 (do not safety wire).

17. Install tail rotor assembly per § 64-10. Match color-coded markings on blades with pitch links.

18. Install main rotor blades per § 62-10. Match color-coded markings on blades with markings on hub and pitch links.

19. Inside engine compartment, remove anti-ice valve cap, starter-generator cap, inducer bleed hose cover, exhaust pipe cover and desiccant, and combustion case drain valve cap. Connect inducer bleed hose to box assembly and tighten clamp. Verify security.

1-80 Assembly Instructions for R66 Helicopter Crated for Export (continued)

20. If ship is equipped with attitude horizon, directional gyro, turn coordinator, and/or vertical card magnetic compass:

A. Attitude Horizon, Directional Gyro, and Turn Coordinator Installation

> **CAUTION**
>
> Directional gyro mount screws must not exceed 1-inch in length.

1. Place a piece of foam under instrument face. Remove (6) screws securing face to console and gently pull face forward. Remove hardware securing instrument hole covers to face and remove covers. Install instruments and secure to face with hardware provided.
2. Connect straight connector(s) to directional gyro and/or turn coordinator. Connect angle connector to attitude horizon, ensuring strain relief points down. Ensure connectors lock. Ty-rap excess wiring. Install screws securing instrument face to console.

B. Vertical Card Magnetic Compass Installation

1. Locate airframe wiring (in windshield center bow), install 2-inch length of B158-3 heat shrink over wiring, and connect compass pins to airframe sockets (polarity is not critical). Slide heat shrink over connection and apply heat. Install (4) screws securing compass to mount, securing wiring atop compass.

21. Connect battery per § 96-10.

> NOTE
>
> Check battery open circuit voltage and perform boost charging or capacity tests as required per Concorde Battery Instructions for Continued Airworthiness.

22. Perform pitot-static leak check per § 95-30.
23. Install Emergency Locator Transmitter (ELT) per § 25-61, as required. Install tailcone cowling assembly per § 53-23.
24. Install fire extinguisher per § 25-62, as required.
25. Fuel helicopter per § 12-41.
26. Verify all shipping supports (ty-raps, foam, tape etc.) have been removed from helicopter. Refer to § 6-70. Secure access panels and inspection doors.

> NOTE
>
> Flight checks to be performed by a qualified pilot and certificated mechanic.

27. Perform ground check per § 5-41.

1-80 Assembly Instructions for R66 Helicopter Crated for Export (continued)

28. Depreserve the engine after storage per RR300 Series Operation and Maintenance Manual (OMM). Install starter-generator cooling hose. Install engine cowling per § 53-21.
29. Install tail rotor dynamic balance equipment per § 18-21.
30. Perform run-up per § 5-42 steps 2 thru 16.
31. Perform tail rotor dynamic balance per § 18-20.
32. Remove tail rotor dynamic balance equipment. Install main rotor balance equipment per § 18-11.

CAUTION

Mast fairing, cowlings, and panels must be installed for flight.

33. Perform hover checks per § 5-43 step 1. DO NOT proceed into forward flight.
34. Track and balance main rotor per § 18-12.
35. While climbing at maximum continuous torque, 60 KIAS:
    a. Evaluate vibration level and controllability.
    b. Perform momentary 30° left yaw to check for adequate directional control.
36. Level flight at typical cruise altitude (deviate as required for weather and terrain), maximum continuous torque:
    a. Evaluate longitudinal and lateral cyclic control forces.
    b. Evaluate collective control forces.
37. Evaluate vibration level at maximum continuous torque and straight-and-level flight.
38. During autorotation at 50 KIAS and 90% rotor RPM, perform momentary 30° right yaw to check for adequate directional control.
39. Check all instruments, gages, and avionics for proper operation.

TABLE 1 SCHEDULED MAINTENANCE, DEFAULT*** Consult latest revision of listed publications for specific applicability.	First 100 Hours*	100 Hours**	200 Hours**	300 Hours**	400 Hours**	600 Hours**	1000 Hours**	2000 Hours**	12 Months**	24 Months**	5 Years**	6 Years**	15 Years**	3000 Cycles**
Replace main gearbox oil filter per § 12-12.	●					●								
Perform 100-hour / annual inspection per § 5-45.		●							●					
Perform main rotor blade tip maintenance per § 62-60.		●												
As required by RR300 Series Operation and Maintenance Manual (OMM), perform maintenance and inspection.			●		●			●	●					●
Service inlet barrier filter per § 71-21.				●					●					
Weigh B381-1 or -4 fire extinguisher per § 25-62A.									●					
Replace both 9v back-up batteries under LH front seat (ships with Lithium-ion main battery only).									●					
Replace main gearbox oil per § 12-11.						●								
Drain and flush tail rotor gearbox per § 12-23.						●								
Replace hydraulic filter per § 12-32.						●								
Clean gearbox chip detectors per § 12-13 & 12-22.						●			●					
Service 528-029-00 cargo hook per § 25-73 Part D.							●				●			
Lubricate swashplate bearings per § 12-90.							●					●		
Perform 2000-hour/15-year inspection per § 5-50.								●					●	
Perform main gearbox internal visual inspection per § 5-74.									●					
Perform pop-out float leak check per § 32-64 Part A.									●					
Replace cockpit camera battery per § 96-120 Part C.									●					
Test and inspect transponder per 14 CFR § 91.413. (U.S.-registered helicopters only).										●				
Perform pop-out float inflation check per § 32-64 Part B.											●			
Perform pop-out float pressure cylinder hydrostatic test (per U.S. DOT-SP 10915).											●			
Pop-out float pressure cylinder maximum life.													●	

* One-time maintenance after new or overhauled main rotor gearbox is installed.

** Recurring inspection.

*** Helicopters on a Part 91 Approved Inspection Program (AIP), a Part 135 Approved Aircraft Inspection Program (AAIP), or an equivalent foreign-approved inspection program, must refer to & comply with that program. Refer to current revisions of FAA Advisory Circulars 91-90 & 135-10.

1-90 Helicopter Servicing

1-91 Scheduled Maintenance and Inspections

Required maintenance and inspection intervals are given in Table 1. Publications listed are subject to revision.

Also consult the following for specific applicability, as some aircraft may require maintenance and inspections in addition to the requirements in Table 1:

- Aircraft maintenance records
- Manufacturers' Service Bulletins (SBs)
- Aviation regulations
- Airworthiness Limitations
- Airworthiness Directives (ADs)

Preventive maintenance is required between scheduled inspections. Fluid leaks, discoloration, fretting, galling, chafing, nicks, scratches, dents, cracks, and corrosion all warrant further investigation. Unairworthy items must be replaced or repaired as allowed by RHC.

1-92 Additional Component Maintenance

NOTE

RHC-manufactured parts not listed in § 1-92 as requiring additional component maintenance, or replacement per § 4-30, are "on condition".

A. 15 YEARS

Remove the following components when they have accumulated 15 years time in service and less than 2000 hours time in service since new, since last 2000-hour maintenance, or since last 12-year maintenance, and perform action indicated:

Part Number	Description	Action
A120-5	Bellcrank – Aft	Replace with new.
A215-015	O-Ring (rollover valves)	Replace with new.
A462-4	Fitting Attachments	Comply with R66 Service Letter SL-38.
A785-36	Hose (engine gearbox vent; earlier ships)	Install KI-258 Firewall Drain Tube Upgrade Kit.
B173-5	V-Belt – Compressor Drive (cabin air conditioning option)	Replace with new.
B361-2	Bearing-Elastomeric (TR)	Replace with new.
C005-4	Main Rotor Hub (C154-1) & Bearing Assembly	Perform inspection and repair per § 62-22, return to RHC for inspection and repair.
C005-13	Main Rotor Blade and Spindle Assembly	Submit to RHC-authorized component maintenance facility for compliance with Airworthiness Limitations for MRBs, or replace with new or overhaul exchange. 15-year maintenance includes blade replacement, boot and O-ring replacement, spindle bearing replacement (as required), pitch horn screw replacement (as required), and inspection.
C008-10	Tail Rotor Assembly	Disassemble. Inspect hub per § 64-42. Comply with Airworthiness Limitations for TRBs.
C017-6	Swashplate Assembly	Perform detail inspection per § 5-52.
C021-1	Tail Rotor Gearbox Assembly	Replace input seal & O-ring, and output seal & O-ring, per § 65-40. During seal replacement, visually inspect exposed portion of bearings for corrosion; replace gearbox if corrosion is evident.
C031-1	Tail Rotor Pitch Control	Replace.
C258-1	Main Rotor Pitch Link Assembly	Replace with C258-5 or -8 link assembly.
C258-5 & -8	Main Rotor Pitch Link Assembly	Perform inspection per § 5-51.
C343-8	Tube (aft servo input)	Disassemble and visually inspect exterior and interior. Verify no corrosion.
D211-3	Hydraulic Reservoir Assembly	Perform detail inspection per § 5-54.

1-92 Additional Component Maintenance (continued)

A. 15 YEARS (continued)

Part Number	Description	Action
D212-5, -6	Hydraulic Servo Assembly	Perform inspection per § 29-30 Part C.
D224-4, or D224-3 with B900-11 Mod	Shaft Assembly – Tail Rotor Drive	Replace C041-11 bearing assembly, or replace C041-12 damper assembly, or replace D224-4 TR drive shaft assembly. Inspect exterior and interior. Verify no corrosion and no obvious damage.
D224-5	Yoke Assy (with D224-6 bearing assy)	Replace with new.
F006-1, -6	Main Rotor Gearbox Assembly	Submit to RHC for 15-year maintenance, or replace with new or overhaul exchange. 15-year maintenance includes seal replacement, O-ring replacement, sealed bearing replacement, rubber mount replacement, R66 SL-11 upgrade (as applicable), and inspection.
F014	Landing Gear Assembly	Perform detail inspection per § 5-53.
F018-1	Clutch Assembly (Revision C & prior)	Replace with Revision D or subsequent.
F018-1	Clutch Assembly (Revision D & subsequent)	Submit to RHC for 15-year maintenance, or replace with new or overhaul exchange. 15-year maintenance includes seal replacement, O-ring replacement, and inspection.
F101-4	Rod End – Elastomeric	Replace with new.
F121-3, -5, -7, & -11	Push-Pull Tube Assembly	Record length. Disassemble and visually inspect exterior and interior. Verify no corrosion.
F174-1	Support Weldment – Center Engine Mount	Visually inspect exterior and interior. Verify no obvious damage and no corrosion.
F642-1 or -6	Engine Output Shaft Weldment, non-circular flange	Replace with F642-7 Output Shaft Assy.
F642-7	Engine Output Shaft Assy, circular flange	Clean interior and exterior. Verify no corrosion and no obvious damage.
F650-1, -2	Main Gearbox Mounting Bolts	Visually inspect exterior and interior. Verify no corrosion.
F771-1	Filter – Engine Air Intake (foam, standard filter only)	Replace with new.
F771-4	Filter – Starter-Generator (cooling air)	Replace with new.
F771-7	Filter – G918-1 (Rev D & on Box Assy (R66 S/N 0173 & subsequent)	Replace with new.
F792-1	Dual Tachometer	Perform accuracy check per § 95-43 Part D.
F792-2	Dual Tachometer	Replace with Revision O or subsequent.
G201-1	Frame, Servo Support	Remove B163-2 rod end. Visually inspect exterior and interior. Verify no corrosion.
NAS557-32A	Grommet-Firewall (surrounds F642-7 engine output shaft assy)	Replace with new.

1-92 Additional Component Maintenance (continued)

B. 2000 HOURS

Remove the following components when they have accumulated 2000 hours time in service since new or since last overhaul, and perform action indicated:

Part Number	Description	Action
A120-5	Bellcrank – Aft	Replace with new.
A130-48	Spacer (at A462-4 fittings)	Replace with new.
A215-015	O-Ring (rollover valves)	Replace with new.
A462-4	Fitting – Control Cable	Replace with new.
A522-10	Control Cable (FCU fuel cutoff)	Replace with new, or replace inner wire.
A522-11	Control Cable (fuel valve)	Replace with new, or replace inner wire.
A522-14	Control Cable (heater valve)	Replace with new, or replace inner wire.
A729-68	Tube (black, earlier ships; used with G727-1 engine gearbox vent tube)	Replace with new.
A785-36	Hose (engine gearbox vent; earlier ships)	Install KI-258 Firewall Drain Tube Upgrade Kit.
A785-37	Hose (inducer bleed)	Replace with new.
A785-38	Hose (starter-generator)	Replace with new.
A918-1 thru -8, -19, or -20	Elastic Cord Assembly	Replace with new. Dash number is selected during flight test evaluation.
A947-2	Flex Plate Assembly (engine driveline)	Replace with new.
B173-5	V-Belt – Compressor Drive (cabin air conditioning)	Replace with new.
B277-32	Clamp (inducer bleed hose, at engine)	Replace with new.
B297-5 or MS26574-5	AUTOPILOT FCS (5 amp) circuit breaker (Garmin FCS installation only)	Replace with new B297-5 Revision G or subsequent, or MS26574-5 circuit breaker.
C005-4	Main Rotor Hub (C154-1) & Bearing Assembly	Replace with new.
C005-13	Main Rotor Blade and Spindle Assembly	Replace with new or overhaul exchange C005-13 main rotor blade and spindle assembly.
C008-10	Tail Rotor Assembly	Replace with new.
C017-6	Swashplate Assembly	Replace with new or overhaul exchange C017-6 swashplate assembly.
C021-1	Tail Rotor Gearbox Assembly	Replace with new or overhaul exchange tail rotor gearbox assembly.
C031-1	Tail Rotor Pitch Control	Replace with new.
C119-2	Bumper – Tail Rotor	Replace with new.
C258-1	Main Rotor Pitch Link Assembly	Replace with new C258-5 or -8 link assembly.

1-92 Additional Component Maintenance (continued)

B. 2000 HOURS (continued)

Part Number	Description	Action
C258-5 & -8	Main Rotor Pitch Link Assembly	Perform inspection per § 5-51 and magnetic particle inspect barrel.
C522-10	Control Cable (FCU throttle)	Replace with new.
C522-11	Control Cable (PTG)	Replace with new.
C649-4	Oil Cooler (main rotor gearbox oil)	Replace with new, or overhaul oil cooler.
C947-3	Flex Plate Assembly (tail rotor driveline)	Replace with new.
D082-1	Tube Assembly (tail rotor guard mount)	Magnetic particle inspect or replace with new.
D211-3	Hydraulic Reservoir Assembly	Replace with new or overhaul exchange reservoir assembly.
D212-5	Hydraulic Servo Assembly	Replace with new or overhaul exchange servo assembly.
D212-6	Hydraulic Servo Assembly	Replace with new or overhaul exchange servo assembly.
D224-3 and -4	Tail Rotor Drive Shaft (D196-1) Assembly	Refer to § 4-30. Replace with new D224-4 tail rotor drive shaft assembly, if required.
D333-13	Fitting (PTG)	Replace with new.
D500-2	Hydraulic Pump Assembly	Replace with new or overhaul exchange pump assembly.
D500-3	Main Rotor Gearbox Oil Pump Assembly	Replace with new or overhaul exchange pump assembly.
D918-1	Elastic Cord – Longitudinal (cyclic pivot)	Replace with new.
D918-2	Elastic Cord – Lateral (cyclic pivot)	Replace with new.
D918-3	Elastic Cord – (collective)	Replace with new.
D930-2	Spring – Safety (FCU throttle input)	Replace with new.
F006-1, -6	Main Rotor Gearbox Assembly	Refer to § 4-30. Replace with new or overhaul exchange F006-1 or F006-6 gearbox assembly, as required.
F018-1	Clutch Assembly	Replace with new or overhaul exchange clutch assembly.
F101-4	Rod End, Elastomeric	Replace with new.
F170-1, -2	Fitting (engine gearbox vent)	Replace with new F170-2 fitting.
F173-1	Strut (exhaust weldment support)	Replace with new.
F453-5	Retainer (at firewall seal)	Replace with new.
F579-1	Engine Air Bellmouth	Replace with new.
F597-1	Seal – Firewall	Replace with new.
F642-1, -6	Engine Shaft Weldment	Replace with new F642-7 weldment.
F649-1	Oil Cooler (engine oil)	Replace with new, or overhaul oil cooler.
F651-2	Element – Main Gearbox Filter	Replace with new.

1-92 Additional Component Maintenance (continued)

B. 2000 HOURS (continued)

Part Number	Description	Action
F651-3	Seal Kit – Main Gearbox Filter	Replace with new.
F771-1	Filter – Engine Air Intake (foam, standard)	Replace with new.
F771-4	Filter – Starter-Generator (cooling air)	Replace with new.
F771-7	Filter – G918-1 Box Assembly	Replace with new.
F792-1 or -2	Dual Tachometer	Replace with new.
G732-2	Cap (with C130-62 spacer)	Replace with G732-3 cap.
A880-908 or AN815-8D	Union – Engine Oil Outlet (replaces CV26-77 check valve on helicopter S/N 0222 and prior)	Replace with new.
A880-908 or AN815-8D	Union – Oil Tank Vent (at engine)	Replace with new.
A880-910 or AN815-10D	Union – Engine Oil Inlet	Replace with new.
MS16562-4	Spring Pin (at D333-13 fitting on PTG lever)	Replace with new.
MS29512-10	Packing (left rollover valve)	Replace with new.
NAS1149E0363R	Washer (at A462-4 fittings)	Replace with new.
NAS557-32A	Grommet – Firewall (engine drive shaft weldment)	Replace with new.
NAS6604-67 or G732-4	Bolt (clutch assembly)	Replace with new G732-4 bolt.

CHAPTER 5

INSPECTIONS

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CHAPTER 5

INSPECTIONS

5-10 Introduction

The R66 helicopter must be inspected periodically to verify it is in airworthy condition; refer to Table 1.

> NOTE
>
> Helicopters on a Part 91 Approved Inspection Program (AIP), a Part 135 Approved Aircraft Inspection Program (AAIP), or an equivalent foreign-approved inspection program, must refer to & comply with that program. Refer to current revisions of FAA Advisory Circulars 91-90 & 135-10.

Fluid leaks, discoloration, dents, scratches, nicks, cracks, galling, chafing, fretting, and corrosion all warrant further investigation. Unairworthy items must be replaced or repaired as allowed by Robinson Helicopter Company. This section contains procedures for performing the required periodic airframe inspections.

> NOTE
>
> Unless directed by Service Bulletin, parts which were not listed as requiring replacement during previous compliance with a 12- or 15-year or 2000-hour Inspection may remain in service until next 15-year or 2000-hour Inspection (whichever occurs first).

5-20 [Reserved]

5-30 General Procedures

Unless otherwise specified, the following general procedures apply to R66 inspection. When required, magnetic particle inspection may be performed in accordance with ASTM E 1444 and MIL-STD-1907. Fluorescent penetrant inspection may be performed in accordance with ASTM E 1417 and MIL-STD-1907.

5-31 Ball and Roller Bearings

The first indication of bearing failure is usually an increase in bearing noise. Noise will almost always start several hours prior to bearing failure. Listen to drive system during start-up and shutdown. A failing bearing will produce a loud whine, rumble, growl, or siren sound. Upon hearing an unusual noise, thoroughly inspect all bearings before further flight.

A failing bearing may have a distorted seal or be exuding a large amount of grease. Monitor bearings for increase in temperature, but do not rely on Telatemps to detect failing bearings as temperature increase may occur only seconds before bearing disintegrates.

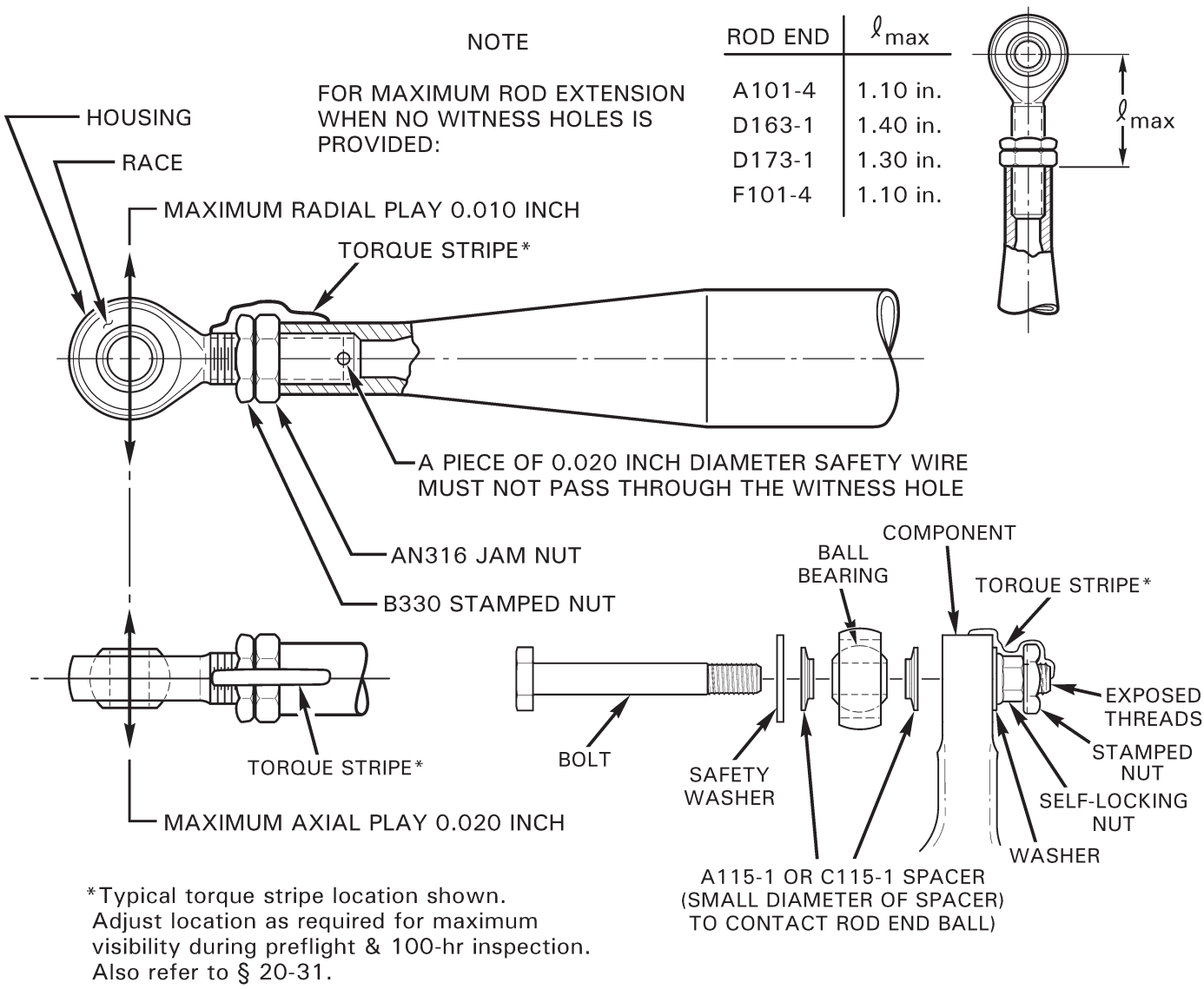
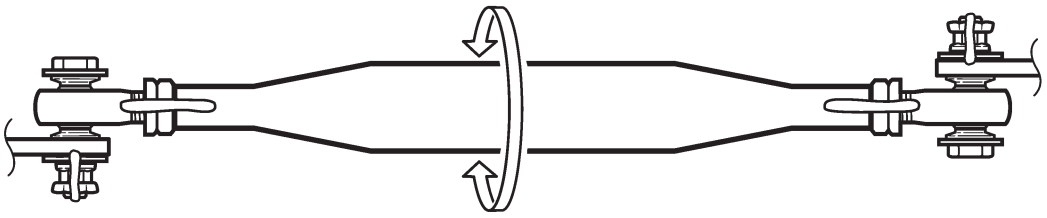


FIGURE 5-1 ROD END AND SPHERICAL BEARING PLAY LIMITS AND TORQUE STRIPE APPLICATION



Position rod ends for maximum rotation

FIGURE 5-2 ROD END CENTERING

5-36 Torque Stripes

WARNING

Refer to Safety Data Sheet (SDS) and observe precautions when working in proximity to hazardous materials.

Refer to Figure 5-1. Apply lacquer-paint Torque Seal® to all critical fasteners after stamped nut installation in a stripe ("torque stripe") extending from the fastener's exposed threads across both nuts and onto the component. Subsequent rotation of the nut or bolt can be detected visually. Position torque stripes for maximum visibility during preflight inspections. Approved Torque Seal® is listed in § 20-74.

If, during inspection, the remaining torque stripe on a fastener is insufficient to determine joint integrity, then remove accompanying stamped nut as required and apply specified torque to fastener. If fastener moves, disassemble joint and inspect parts for damage such as fretting, thread deformation, hole elongation, etc.; replace damaged parts. If fastener does not move, install new stamped nut as required & standard torque per § 20-32. Torque stripe fastener per Figure 5-1.

5-40 Operation Checks for 100-Hour / Annual Inspection

Complete the following checklists in conjunction with 100-hour / annual inspection. Note and correct any discrepancies.

5-41 Ground Check (aircraft not running)

1. _____ **Twist Grip:**
   Verify twist grip smooth rotation without binding in full up and full down collective position. Verify over center spring holds twist grip full open or closed.

2. _____ **Fuel Cutoff Valve:**
   Verify smooth actuation without binding. Verify proper function of lock button.

3. _____ **Collective Control:**
   Verify proper operation through full control travel with and without friction applied. With friction off, verify approximately one-half inch total free play before encountering hydraulic resistance. Verify normal hydraulic resistance throughout remainder of control travel. With friction on, verify increased resistance but no binding or locking of control. Verify power turbine governor rigging as follows:

   a. _____ Turn battery switch on. With collective full down, hold beep switch actuator all the way down. Have a second person verify the PTG reads approximately 45°.

   b. _____ With collective full down, hold beep switch actuator all the way up. Have a second person verify the PTG reads approximately 65°. Return actuator to nominal position. Turn battery switch off.

4. _____ **Cyclic Control:**
   With friction off, verify approximately one-half inch total longitudinal and one inch total lateral free play before encountering hydraulic resistance. Verify normal hydraulic resistance throughout remainder of control travel. With friction on, verify increased resistance but no binding or locking of control.

5. _____ **Tail Rotor Pedals:**
   Verify smooth actuation without binding. Verify proper pedal position for pilot and locking pin security.

6. _____ **Removable Controls (if installed):**
   Verify proper operation and locking pin security.

5-45 100-Hour / Annual Maintenance and Inspection

RHC recommends retaining a copy of the most recently performed 100-hour / annual checklist with the aircraft's maintenance records to meet the requirement of 14 CFR § 91.417 (b)(1).

R66 Serial No.: _____ Technician Name: _____

Registration No.: _____

Collective-Activated (Time In Service) Hourmeter Indication: _____ Technician Certificate Number: _____

Helicopter Total Time In Service: _____

_____ **Operation Checks:**
Perform ground and flight checks per § 5-40.

A. Preparation

CAUTION

Prior to pre-inspection cleaning, identify any residue and its source for follow-up examination. Residue may be fuel, oil, grease, paint, plastic, magnetic-metal, non-magnetic-metal, etc., or a combination; metal residue requires careful attention as it may indicate structural damage. Residue may be visible on structures adjacent to the source and not the source part itself.

_____ **Cleaning (required by 14 CFR Part 43, Appendix D, paragraph (a)):**
Clean main and tail rotor blades, hubs, and airframe exterior with a mild soap (pH between 7 & 9) and water solution per Chapter 20.

CAUTION

Do not spray main rotor hub, tail rotor gearbox vent, hydraulic reservoir vent, swashplate area, or bearing seals with high-pressure water or solvent as water or solvent may cause corrosion or breakdown of lubricants. See RR300 Series Operation and Maintenance Manual (OMM) for engine cleaning instructions and precautions.

5-45 100-Hour / Annual Inspection (continued)

A. Preparation (continued)

_____ **Access and Inspection Panels:**
Refer to R66 Illustrated Parts Catalog Chapter 6 for access and inspection panel locations. Remove or open necessary panels, doors, covers, fairings, and cowlings in accordance with 14 CFR Part 43, Appendix D, paragraph (a).

NOTE

If radio antennas are installed on removed panels, disconnect antenna lead and corresponding ground wire. Pull respective radio circuit breaker and tag circuit breaker with "Antenna Removed."

CAUTION

Instrument console removal (§ 95-10) is not required for scheduled inspections. Sufficient access for inspection is gained by removing the chin inspection panel, as well as removal of installed avionics, as required (refer to Chapter 97 & R66 SB-35A).

B. Inspection

CABIN FORWARD FOOTWELLS

_____ **Tail Rotor Pedal Bearing Blocks:**
Remove pedal bearing block covers as required. Examine accessible portion with inspection light and mirror. Inspect condition. Check for looseness or play in pedal bearings. Maximum allowable play is 0.080 inch axially and 0.030 inch radially. Verify bearing block security.

_____ **Adjustable Tail Rotor Pedals:**
Inspect condition. Verify no cracks in welds. Verify locking pins engage holes to secure adjustable pedals. Verify proper operating clearance. Verify no evidence of contact between outboard portion of lateral (torque) tube of RH pedal and under-floor longitudinal stiffener. Verify smooth actuation.

_____ **Co-Pilot Removable Tail Rotor Pedals:**
Inspect condition. Verify no cracks in welds. Verify locking pins engage holes to secure removable pedals. Verify proper operating clearance and smooth actuation.

_____ **Cabin Heater Diffusers:**
Inspect condition. Verify marking legibility. Verify no significant nicks, scratches or dents, or cracks in welds. Verify security.

_____ **Fire Extinguisher and Mount:**
Inspect condition. Inspect fire extinguisher per § 25-62A. Verify no loss of charge or obstructions in extinguisher nozzle. Verify security.

5-45 100-Hour / Annual Inspection (continued)

CIRCUIT BREAKER PANEL (continued)

_____ **Wiring:**
Inspect condition. Verify no loose, chafed, or broken wires or terminals. Verify neatness, proper routing and installation, and security.

_____ **Fasteners & Torque Stripes:**
Inspect condition. Verify proper installation and security of fasteners. Renew deteriorated torque stripes per Figure 5-1.

_____ **Close & Secure:**
Verify foreign objects are removed. Verify equipment security. Verify cleanliness of interior and of access cover. Close cover and verify security.

UNDER LEFT FRONT SEAT

_____ **Lithium-Ion Battery Circuit Back-Up Batteries (required with optional Lithium-ion main battery):**
Inspect condition. Verify presence and proper orientation of (2) 9V back-up batteries. Verify security of battery trays and G468-1 mount assembly. Verify legibility of silkscreen lettering on mount. Inspect wiring for obvious damage.

HORIZONTAL CONTROL TUNNEL (Front seats)

_____ **Covers:**
Inspect condition. Verify marking legibility.

_____ **Antenna Wiring & Connectors:**
Inspect condition. Verify no loose, chafed, frayed, or broken wires. Verify no damaged connectors. Verify neatness, proper routing and installation, and security.

_____ **Cyclic Box Assembly:**
Inspect condition. Verify no nicks, scratches, dents, cracks, corrosion, or loose rivets. Verify no distortion or damage on cyclic stop sheet metal assembly. Verify security.

_____ **Cyclic Stick Assembly:**
Inspect condition. Verify no nicks, scratches, dents, cracks, or corrosion. Verify no cracks in welds. If paint has worn thru to metal, touch-up with § 20-75 approved primer. Verify security, proper operating clearance, and smooth actuation. Verify security of removable co-pilot grip and locking pin.

_____ **Cyclic Boot:**
Inspect condition. Verify proper locking function of boot snaps. Verify no defects, tears, or material deterioration. Verify security.

_____ **Cyclic Friction Assembly:**
Inspect condition. Inspect link rod end bearings per § 5-33. Verify no excessive flaring at either end of friction spacer. Verify proper installation, security, and operation.

5-45 100-Hour / Annual Inspection (continued)

HORIZONTAL CONTROL TUNNEL (Front seats; continued)

_____ **Cyclic Pivot:**
Inspect condition. Verify no nicks, scratches, dents, cracks, or corrosion. Inspect spherical bearings per § 5-33. Verify proper installation, security, and operating clearance.

_____ **Cyclic Torque Tube:**
Examine accessible portion with inspection light and mirror. Verify no nicks, scratches, dents, cracks, or corrosion. Verify no cracks around reinforcement blocks on forward end of torque tube. Verify proper installation, security, and operating clearance.

_____ **Horizontal Push-Pull Tubes:**
Examine accessible portion with inspection light and mirror. Inspect condition per § 5-32. Verify no nicks, scratches, chafing, dents, cracks, or corrosion. Inspect rod end bearings per § 5-33; verify rod ends are centered and evaluate torque stripes per § 5-36. Check witness holes for proper thread engagement. Verify proper installation, security, and operating clearance.

_____ **Collective Stick Assembly:**
Inspect condition. Verify no nicks, scratches, dents, cracks, or corrosion. Verify no cracks in welds. Verify proper installation, security, and operation of collective micro switches. Verify security, proper operating clearance, and smooth actuation of both flight and throttle controls. Verify over center spring holds twist grip full open or full closed. Verify placard legibility.

_____ **Collective Stick Torque Tube:**
Inspect condition. Verify no nicks, scratches, dents, cracks, or corrosion.

_____ **Collective Boot:**
Inspect condition. Verify proper locking function of boot snaps. Verify ty-rap is properly installed (loosely securing boot around collective stick). Verify no defects, tears, or material deterioration. Verify security.

_____ **Fuel Valve Knob and Guard:**
Inspect condition. Verify cable and mounting bezel security. Verify proper adjustment and smooth operation of valve. Verify guard is present.

_____ **Collective Friction & Stop Assembly:**
Inspect condition. Verify no nicks, scratches, dents, cracks, or corrosion in stop assembly. Verify no bending or binding of stop through full control travel, with and without friction applied. Measure collective friction per § 67-22. Verify proper installation and security of collective friction lever and stop assembly.

5-45 100-Hour / Annual Inspection (continued)

HORIZONTAL CONTROL TUNNEL (Front seats; continued)

_____ **Autopilot (if installed; Garmin or HeliSAS):**
Inspect condition of pitch servo, pitch & roll servo linkages to cyclic, and wiring; verify security, no obvious damage, and neatness. While observing servo linkages, have second person manipulate flight controls through full range of travel; verify operating clearance.

_____ **Co-Pilot Removable Collective Stick Assembly:**
Remove co-pilot collective stick assembly. Inspect condition. Verify no nicks, scratches, dents, cracks, or corrosion. Verify no damage to spring pin and safety wire at coupling. Firmly grasp coupling and rotate twist grip in each direction with opposite hand. Verify no free play of coupling or spacer relative to torque tube. Install removable collective stick in helicopter and verify both locking pins engage holes to secure stick. Verify security, proper operating clearance, and smooth actuation of both flight and throttle controls. Verify placard legibility.

_____ **Co-Pilot Removable Collective Boot:**
Inspect condition. Verify proper locking function of boot snaps. Verify ty-rap is properly installed (loosely securing boot around collective stick). Verify no defects, tears, or material deterioration. Verify security.

_____ **Pitot & Static Lines & Drains:**
Inspect pitot and static lines for obstructions, cracking, chafing, pinching, or kinking. If internal moisture is evident, remove drain plug from tee fitting on affected line, remove moisture, install drain plug(s), and verify integrity of pitot and static line connections. Verify line security.

_____ **Wiring:**
Inspect condition. Verify no loose, chafed, or broken wires or terminals. Verify neatness, proper routing and installation, and security.

_____ **Fasteners & Torque Stripes:**
Inspect condition. Verify proper installation and security of fasteners. Renew deteriorated torque stripes per Figure 5-1.

_____ **Antennas:**
Inspect condition. Verify no cracks where antennas mount to cowling. Verify security.

_____ **Close & Secure:**
Verify foreign objects are removed. Verify equipment security. Verify cleanliness of interior and of inspection and access covers and cowlings. Connect ELT (if installed) wiring at connectors and anti-ice switch wiring terminals under cyclic box cover. Connect antenna leads and ground wires (if installed). Install covers and cowlings removed in preceding steps. Verify security. Verify security of removable and adjustable controls. Fasten cyclic, collective, and removable collective boot snaps.

5-45 100-Hour / Annual Inspection (continued)

HORIZONTAL CONTROL TUNNEL (Aft seats)

_____ **Covers:**
Inspect condition. Verify marking legibility.

_____ **Antenna Wiring & Connectors:**
Inspect condition. Verify no loose, chafed, frayed, or broken wires. Verify no damaged connectors. Verify neatness, proper routing and installation, and security.

_____ **Cyclic Yoke:**
Inspect condition. Verify no cracks, corrosion, or fretting. Inspect spherical bearings per § 5-33. Verify proper installation, security, and operating clearance.

_____ **Cyclic Fork:**
Inspect condition. Verify no nicks, scratches, dents, cracks, or corrosion. Inspect rod end bearings per § 5-33. Verify proper installation, security, and operating clearance.

_____ **Cyclic Torque Tube:**
Examine accessible portion with inspection light and mirror. Verify no nicks, scratches, dents, cracks, or corrosion. Verify no cracks around reinforcement blocks on aft end of torque tube. Verify proper installation, security, and operating clearance.

_____ **Horizontal Push-Pull Tubes:**
Examine accessible portion with inspection light and mirror. Inspect condition per § 5-32. Verify no nicks, scratches, chafing, dents, cracks, or corrosion. Inspect rod end bearings per § 5-33; verify rod ends are centered and evaluate torque stripes per § 5-36. Check witness holes for proper thread engagement. Verify proper installation, security, and operating clearance.

5-45 100-Hour / Annual Inspection (continued)

HORIZONTAL CONTROL TUNNEL (Aft seats; continued)

_____ **Fuel Cutoff and Throttle Control:**
Inspect condition. Verify proper fuel cutoff and throttle control clearance to installed equipment and surrounding structure. Verify proper installation and security.

_____ **Cabin Heater Valve and Control:**
Inspect condition. Verify control clearance to installed equipment and surrounding structure. Verify heater valve security. Verify proper installation and smooth operation of valve.

_____ **Flight Control Bellcranks:**
Inspect condition. Verify no nicks, scratches, dents, cracks, or corrosion. Inspect spherical bearings per § 5-33. Verify proper installation, security, and operating clearance.

_____ **Bellcrank Support:**
Inspect condition. Verify no cracks or corrosion in welds. Verify no cracks where support mounts to keel panels. Verify proper installation and security.

_____ **Evaporator and Blower Assembly (Air Conditioning; if installed):**
Remove middle seat assembly and cover, and inspect condition. Verify refrigerant line security, no damage, and clearance to adjacent structure. Verify no loose, chafed, frayed, or broken wires. Verify proper installation and security of blower and evaporator components.

_____ **Evaporator Drain Tubes and Valve (Air Conditioning; if installed):**
Remove middle seat assembly and cover, and covers inside left and right seat compartments to access drain system. Verify tubes are unobstructed. Function-check drain system by simultaneously squeezing drain tube and sediment tube near tee-fitting and verify check-valve ball moves up momentarily.

VERTICAL CONTROL TUNNEL

_____ **Vertical Push-Pull Tubes:**
Examine accessible portion with inspection light and mirror. Inspect condition per § 5-32. Verify no nicks, scratches, chafing, dents, cracks, or corrosion. Inspect rod end bearings per § 5-33; verify rod ends are centered and evaluate torque stripes per § 5-36. Check witness holes for proper thread engagement. Verify proper installation, security, and operating clearance.

_____ **Beep Switch Actuator:**
Inspect condition. Verify proper control clearance to installed equipment and surrounding structure. Verify proper actuator installation, security, and operation.

_____ **Tunnel Interior:**
Verify general cleanliness of tunnel interior. Inspect for fluid leaks or seepage; investigate cause and correct.

_____ **Seat Backs:**
Inspect condition. Verify upholstery cleanliness and security.

5-45 100-Hour / Annual Inspection (continued)

CABIN BULKHEAD

_____ **Blind Encoder & Engine Monitoring Unit (EMU):**
Inspect condition. Inspect wiring for obvious damage. Verify no cracks where units mount to bulkhead. Verify proper installation and security. Download EMU data as required per RR300 Series OMM.

_____ **Fuse Block and Fuses (Air Conditioning; if installed):**
Inspect condition. Verify no corrosion. Verify correct fuse amperage and security.

_____ **Antenna Wiring:**
Inspect condition. Verify no loose, chafed, frayed, or broken wires. Verify neatness, proper routing and installation, and security. Check grommets for proper installation.

_____ **Pitot & Static Lines:**
Inspect pitot and static lines for obstructions, cracking, chafing, pinching, or kinking. Verify integrity of pitot and static line connections. Verify line security.

_____ **Seat Back Interior:**
Verify general cleanliness of seat back interior. Inspect for fluid leaks or seepage; investigate cause and correct.

_____ **Fuel Flow Meter Adapter (if installed):**
Refer to § 28-23. Visually inspect adapter for any obvious damage; verify proper installation and security. Inspect wiring for loose, chafed, frayed, or broken wires. Verify no damaged connectors. Verify wiring neatness, proper routing and installation, and security.

_____ **Cabin Bulkhead:**
Examine accessible portion with inspection light and mirror. Verify no nicks, scratches, dents, cracks, corrosion, or loose rivets. Verify stiffener security. Verify upholstery cleanliness and security.

_____ **Wiring:**
Inspect condition. Verify no loose, chafed, or broken, wires or terminals. Verify neatness, proper routing and installation, and security.

_____ **Fasteners & Torque Stripes:**
Inspect condition. Verify proper installation and security of fasteners. Renew deteriorated torque stripes per Figure 5-1.

_____ **Antennas:**
Inspect condition. Verify no cracks where antennas mount to cowlings. Verify security.

_____ **Close & Secure:**
Verify foreign objects are removed. Verify equipment security. Verify cleanliness of interior and of inspection and access covers and cowlings. Connect antenna leads and ground wires (if installed). Install covers and cowlings removed in preceding steps. Verify security.

5-45 100-Hour / Annual Inspection (continued)

MAIN ROTOR GEARBOX COMPARTMENT (continued)

_____ **Cabin Bulkhead:**

Inspect condition. Verify no deformation, buckling, wrinkling, nicks, scratches, dents, cracks, corrosion, fretting, or loose rivets. Verify no leakage from fuel tanks. Verify security.

_____ **Main Rotor Gearbox:**

Inspect condition. Verify no damage, material deterioration, or deformation of gearbox mounts. Verify no leakage at mast tube-to-gearbox attachment. Inspect mast tube for cracks. With ship on level ground, verify correct oil level and cleanliness through sight gage and adjust or flush as required. Verify security of Hall Effect senders and yoke magnets. Inspect oil lines for leakage, chafing, or obvious damage. Inspect oil pump mounting and fittings for leaking or obvious damage. Inspect gearbox oil filter for leakage or for tripped bypass indicator. Verify oil system proper installation and security.

NOTE

At 600 hours time in service or annually, whichever occurs first, remove chip detector and clean detector's magnetic probe and adjacent metal body using a toothbrush and approved solvent per § 12-13 Part B. Service gearbox, change oil and filter, and clean chip detector at intervals recommended in § 1-90.

_____ **Gearbox Mounting Bolts:**

Torque check (4) F650 bolts securing gearbox to upper frame; refer to § 20-33 for special torque. Apply torque to bolt head while holding nut stationary using Lycoming cylinder base-nut wrench or equivalent. If any bolt rotates during check, torque each bolt in a clockwise pattern until all (4) bolts pass check without rotating. Reapply torque stripe per Figure 5-1 as required.

_____ **Rotor Brake:**

Inspect condition. Verify integrity of brake pads and 0.030 inch minimum pad thickness. Verify brake pads are clear of engine shaft with brake released. Inspect micro switches for cracks. Verify no loose, chafed, or broken wires or terminals. Verify security. Inspect both pulleys (one at end of lever, one next to fuel tank) for cracks. Verify no frayed strands or binding of rotor brake activating cable. Verify proper routing and installation, security, and operation of brake and brake micro switch.

_____ **Hydraulic Servo Support Frame:**

Inspect condition. Inspect rod ends per § 5-33. Use an inspection light and mirror to inspect all parts of each weld. Verify no cracks or corrosion in servo support. Verify proper installation and security.

5-45 100-Hour / Annual Inspection (continued)

MAIN ROTOR GEARBOX COMPARTMENT (continued)

_____ **Jackshaft:**
Inspect condition. Verify no cracks or corrosion in welded assembly. Inspect jackshaft to vertical push-pull tube attachment. Inspect jackshaft aft support frame attachment and forward attachment rod end per § 5-33. Inspect C343-8 tube and rod ends linking jackshaft to aft servo. Verify security and proper operating clearance.

_____ **Main Rotor Push-Pull Tubes:**
Examine accessible portion with inspection light and mirror. Inspect condition per § 5-32. Verify no nicks, scratches, chafing, dents, cracks or corrosion. Inspect rod end bearings per Section 5-33; verify rod ends are centered and evaluate torque stripes per § 5-36. Check witness holes for proper thread engagement. Verify proper installation, security, and operating clearance.

_____ **Tail Rotor Push-Pull Tube & Forward Bellcrank:**
Examine accessible portion with inspection light and mirror. Inspect condition per § 5-32. Verify no nicks, scratches, chafing, dents, cracks, or corrosion. Inspect rod end bearings per § 5-33; verify rod ends are centered and evaluate torque stripes per § 5-36. Check witness holes for proper thread engagement. Inspect bellcrank and bellcrank sheet metal mounting for nicks, scratches, dents, cracks, or corrosion. Inspect spherical bearings per § 5-33. Verify proper installation, security, and operating clearance.

_____ **Hydraulic Reservoir:**
Inspect condition. Verify no significant leakage. Replace filter and packing at intervals specified in § 1-90. Drain and flush hydraulic system per § 12-33 if oil has turned dark or emits bad odor. Add fluid as required. Verify security.

CAUTION

Cleanliness of hydraulic fluid is vital to proper system operation. Service hydraulic system with clean fluid from sealed containers. Verify funnels, tubing, and other service tooling is free of contaminants.

_____ **Forward Hydraulic Servos:**
Inspect condition; verify no obvious defects. Hydraulic fluid seepage is permissible ("seepage" is evidence of fluids without flow, drips, or runs) provided fluid does not contaminate MRGB rubber mounts. Verify servo input rod end/clevis area is clean; cleanse area with no-residue, nonalcoholic solvent as required. Verify approximately 0.040 inch total free-play at servo valve input. Inspect rod ends per § 5-33. Verify valve clearance to surrounding structure while flight controls are moved through full range of travel. Inspect condition and verify security of scissors at upper clevis of servos. Inspect clevis security and torque stripe per Figure 5-4A.

5-45 100-Hour / Annual Inspection (continued)

MAIN ROTOR GEARBOX COMPARTMENT (continued)

CAUTION

Use LPS PreSolve to clean hydraulic parts. Do not use alcohol.

_____ **Aft Hydraulic Servos:**
Inspect condition; verify no obvious defects. Hydraulic fluid seepage is permissible ("seepage" is evidence of fluids without flow, drips, or runs) provided fluid does not contaminate MRGB rubber mounts. Verify servo input rod end/clevis area is clean; cleanse area with no-residue, nonalcoholic solvent as required. Verify approximately 0.040 inch total free-play at servo valve input. Inspect rod ends per § 5-33. Verify valve clearance to surrounding structure while flight controls are moved through full range of travel. Inspect clevis security and torque stripe per Figure 5-4A.

_____ **Hydraulic-Servo Absorbent Pad (Recent Servos Only):**
If installed, examine white absorbent pad(s); replace pad if damaged. If pad is discolored, remove pad from tray, then use a roller to squeeze out absorbed fluid, or replace pad. Clean tray & install pad.

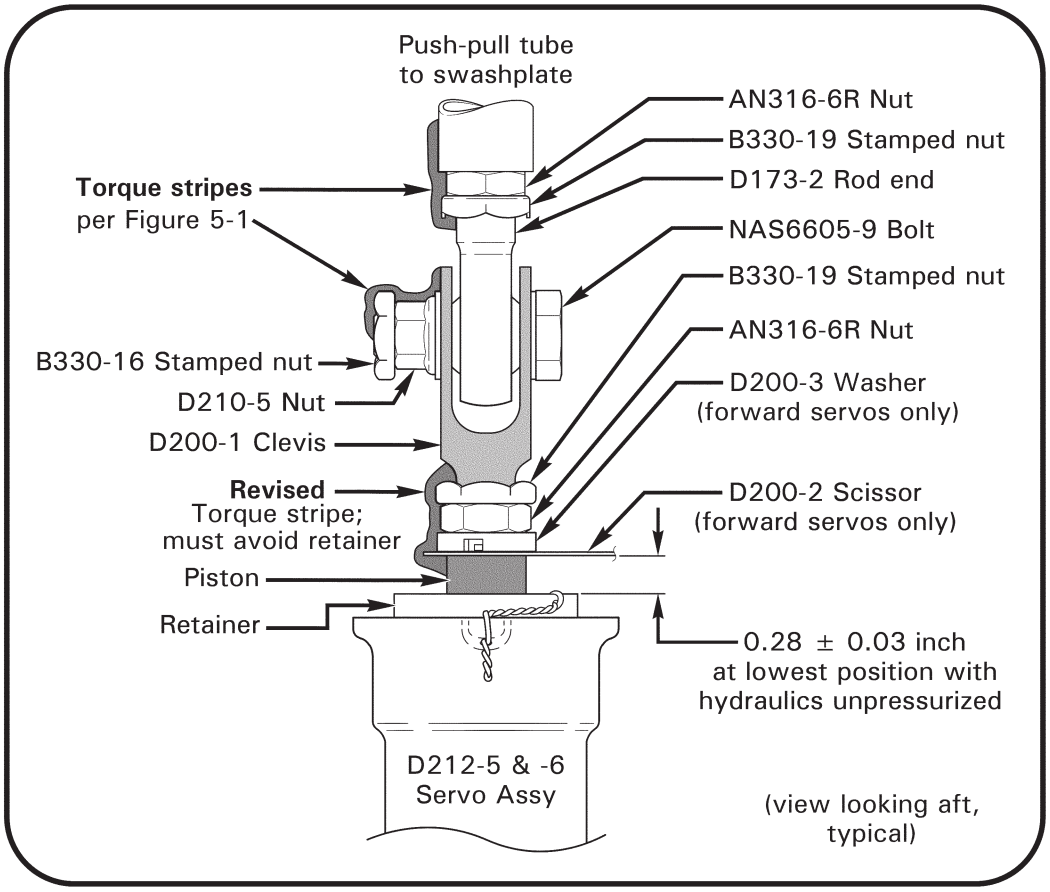


FIGURE 5-4A CLEVIS TORQUE STRIPE

5-45 100-Hour / Annual Inspection (continued)

MAIN ROTOR GEARBOX COMPARTMENT (continued)

_____ **Hydraulic Hoses, Lines, & Fittings:**
Inspect condition. Verify no leakage, chafing, or obvious damage to hydraulic lines. Verify integrity of connections. Verify fluid line clearance to installed equipment and surrounding structure and sufficient fluid hose slack available through full control travel. Verify proper installation and security.

_____ **Hydraulic Pump:**
Inspect condition. Inspect Telatemp per § 5-35. Verify no significant leakage. Verify proper installation and security.

_____ **Upper Steel Tube Frame:**
Inspect condition. Verify no nicks, scratches, dents, cracks, or corrosion. Verify no chafing where wires, hoses, or clamps attach to frame. Examine each weld for cracks with an inspection light and mirror.

CAUTION

Upper steel tube frame is fatigue loaded and therefore susceptible to fatigue cracks. Inspect all joints thoroughly.

_____ **F908-1 (Tail Rotor Drive) Yoke Assembly:**
Inspect condition. Verify no cracks, corrosion, or fretting. Verify proper installation, security, and operating clearance. Verify security of magnets.

_____ **G779-1 Pulley (Air Conditioning; if installed):**
Inspect condition. Verify no cracks, corrosion, or fretting. Verify no nicks or sharp edges in fins that could damage v-belt. Verify proper installation, security, and operating clearance.

_____ **V-Belt (Air Conditioning; if installed):**
Inspect condition. Replace belt if exhibiting frayed edges, excessive cracking, heat damage, or rubber deterioration. Verify 4.5–5.5 lb of force applied mid-span deflects belt 0.16-inch; adjust as required per § 21-21.

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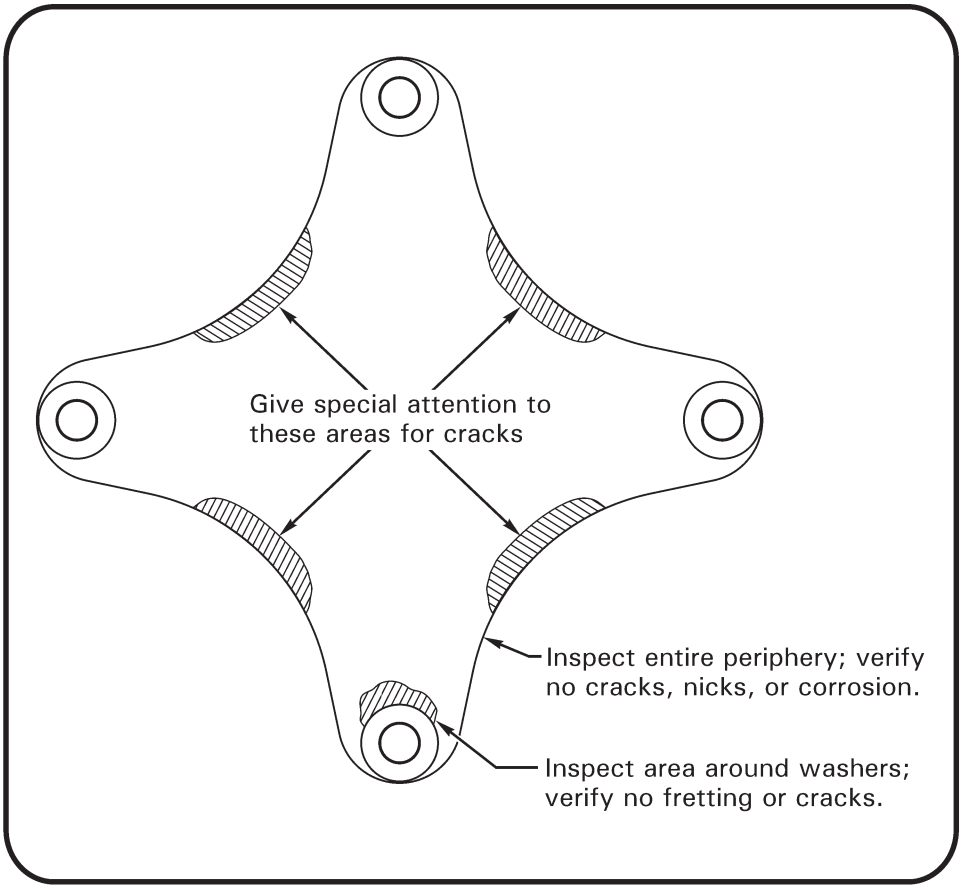


FIGURE 5-4B FLEX PLATE INSPECTION

5-45 100-Hour / Annual Inspection (continued)

MAIN ROTOR GEARBOX COMPARTMENT (continued)

_____ **Compressor Assembly (Air Conditioning; if installed):**
Inspect condition, including integrity of belt-tension slotted plate. Verify security of mounting. Verify no loose, chafed, frayed, or broken wires. Verify proper installation and security of pressure switches, snubber, and refrigerant lines.

_____ **Refrigerant Hose Assemblies (Air Conditioning; if installed):**
Verify security, no damage, and clearance to adjacent structure. Verify dust caps installed on service fittings where lines mount to compressor.

_____ **F196-1 (Tail Rotor Drive) Fan Shaft:**
Inspect condition. Verify no shaft corrosion. Remove any light surface corrosion and apply wax or suitable corrosion inhibitor. Verify no cracks, corrosion, or fretting in fore and aft weldment. Verify proper installation, security, and operating clearance.

5-45 100-Hour / Annual Inspection (continued)

MAIN ROTOR GEARBOX COMPARTMENT (continued)

_____ **C947-3 (Tail Rotor Drive) Plate Assemblies, Forward and Intermediate:**
Refer to Figure 5-4B. Inspect condition. Verify no distortion, nicks, scratches, cracks, corrosion, or fretting. If fretting is detected, contact RHC Technical Support. Verify bonded washers are installed on both sides of each flex plate ear. Verify proper installation, security, and operating clearance.

_____ **Fanwheel Assembly and Scroll Assembly:**
Clean fanwheel blades and inspect condition. Verify no cracks, corrosion, or obvious damage on blade leading edges or fan assembly. Verify 0.10 inch minimum gap between G174-1 fanwheel assembly and forward and aft F305-5 inlets. Check gap all the way around; rotate fanwheel and check gap again (several positions). If gap does not meet minimum limit, trim inlets per § 79-11. Verify proper installation, security, and operating clearance. Verify no cracks or damage to scroll assembly.

_____ **Emergency Locator Transmitter (ELT; if installed):**
In accordance with local regulation, test per ELT manufacturer instructions. If 406 Mhz ELT, confirm programming tag matches helicopter registration. If RHC installation, inspect condition of both primary hook & loop strap and secondary buckle strap; replace strap(s) if damaged or deteriorated. Verify ELT security and clearance to drive train.

_____ **Pitot Line & Static Vent:**
Inspect pitot and static lines for obstructions, cracking, chafing, pinching or kinking. Verify integrity of pitot and static line connections. Verify line security.

_____ **Horizontal Firewall:**
Inspect condition. Verify no deformation, buckling, wrinkling, nicks, scratches, dents, cracks, corrosion, fretting, or loose rivets. Verify no leakage from fuel tanks.

_____ **Wiring:**
Inspect condition. Verify no loose, chafed, or broken wires or terminals. Verify neatness, proper routing and installation, and security.

_____ **Fasteners & Torque Stripes:**
Inspect condition. Verify proper installation and security of fasteners. Renew deteriorated torque stripes per Figure 5-1.

_____ **Antennas:**
Inspect condition. Verify no cracks where antennas mount to cowling. Verify security.

_____ **Cowling Doors:**
Inspect condition. Verify proper operation of fasteners.

_____ **F910-1 (Main Rotor Drive) Yoke:**
Inspect condition. Verify no cracks, corrosion, or fretting. Verify proper installation, security, and operating clearance.

5-45 100-Hour / Annual Inspection (continued)

MAIN ROTOR GEARBOX COMPARTMENT (continued)

_____ **A947-2 (Main Rotor Drive) Plate Assemblies:**
Refer to Figure 5-4B. Inspect condition. Verify no distortion, nicks, scratches, cracks, corrosion, or fretting. If fretting is detected, contact RHC Technical Support. Verify bonded washers are installed on both sides of each flex plate ear. Verify proper installation, security, and operating clearance.

_____ **F642 (Engine) Shaft Weldment:**
Inspect condition. Verify 0.2 inch minimum clearance between shaft weldment and firewall grommet; verify equal gap concentrically between shaft and box assembly hole edges. Adjust F174-1 support weldment rod ends per § 53-31 as required. Rotate shaft and verify no cracks, corrosion, or fretting. Verify proper installation, security, and operating clearance. If shaft forward flange is not circular, remove shaft from service and install F642-7 shaft.

_____ **Engine Firewall:**
Inspect condition. Verify no deformation, buckling, wrinkling, nicks, scratches, dents, cracks, corrosion, fretting, or loose rivets. Verify no leakage from fuel tanks.

_____ **Engine Oil Tank:**
Inspect condition. Verify no leakage or obvious damage to oil tank exterior. Check tank interior for foreign objects. Add oil as required per R66 POH Section 8. Verify tank security.

_____ **Tailcone Attachment:**
Inspect condition. Verify no cracks near fasteners attaching tailcone to upper frame. Verify proper installation and security.

_____ **Upper Steel Tube Frame:**
Inspect condition. Verify no nicks, scratches, dents, cracks, or corrosion. Verify no chafing where wires, hoses, or clamps attach to frame. Examine each weld for cracks with an inspection light and mirror.

CAUTION

Upper steel tube frame is fatigue loaded and therefore susceptible to fatigue cracks. Inspect all joints thoroughly.

_____ **Antenna Wiring & Connectors:**
Inspect condition. Verify no loose, chafed, frayed, or broken wires. Verify no damaged connectors. Verify neatness, proper routing and installation, and security. Check grommets for proper installation.

_____ **Fasteners & Torque Stripes:**
Inspect condition. Verify proper installation and security of fasteners. Renew deteriorated torque stripes per Figure 5-1.

5-45 100-Hour / Annual Inspection (continued)

ENGINE (continued)

_____ **Firewalls:**

Inspect condition. Verify no deformation, buckling, wrinkling, cracks, corrosion, fretting, or loose rivets. Pay particular attention to structural attachment points. Inspect condition of engine-to-firewall seal. Verify no open holes.

WARNING

Open holes in engine-to-firewall seals are potential fire leak paths.

_____ **Engine Mounts:**

Inspect condition. Verify no cracks or corrosion in engine mount weldment. Verify safety wire and security of mounting bolts.

_____ **Lower Steel Tube Frame:**

Inspect condition. Verify no nicks, scratches, dents, cracks, or corrosion. Verify no chafing where wires, hoses, or clamps attach to frame. Examine each weld for cracks with an inspection light and mirror.

_____ **Condenser and Fan Assemblies (Air Conditioning; if installed):**

Inspect condition. Verify security of fans, box assembly, condenser, and firewall supports. Verify security of desiccant cap.

_____ **Refrigerant Line Assemblies (Air Conditioning; if installed):**

Inspect condition. Verify security, no damage, and clearance to adjacent structure.

_____ **Wiring:**

Inspect condition. Verify no loose, chafed, or broken wires or terminals. Check for heat or fluid damage. Verify neatness, proper routing and installation, and security.

_____ **Fasteners & Torque Stripes:**

Inspect condition. Verify proper installation and security of fasteners. Renew deteriorated torque stripes per Figure 5-1.

_____ **Close & Secure:**

Verify foreign objects are removed. Verify equipment security. Verify cleanliness of interior and of cover or cowling. Install/close inspection covers or cowlings removed in preceding steps. Verify security.

5-45 100-Hour / Annual Inspection (continued)

TAILCONE & STABILIZERS

_____ **Inspection Plugs:**
Inspect condition. Verify proper operation of fasteners.

_____ **Tail Rotor Drive Shaft Assembly:**
Examine accessible portion through inspection holes with inspection light and mirror. Verify no cracks, corrosion, or fretting in fore and aft weldment. Verify no evidence of drive shaft contact with tailcone bays. Verify no bowing, bends, dents, cracks, or corrosion. Perform tail rotor drive shaft runout per § 65-21. Verify proper installation, security, and operating clearance.

CAUTION

Bowing, bends, dents, cracks, or corrosion are cause for immediate replacement of tail rotor drive shaft.

_____ **Tail Rotor Push-Pull Tube & Forward Bellcrank:**
Examine accessible portion through inspection holes with inspection light and mirror. Inspect condition per § 5-32. Verify no nicks, scratches, chafing, dents, cracks, or corrosion. Inspect rod end bearings per § 5-33; verify rod ends are centered and evaluate torque stripes per § 5-36. Check witness holes for proper thread engagement. Inspect bellcrank and bellcrank mount for nicks, scratches, dents, cracks, or corrosion. Inspect spherical bearings per § 5-33. Verify proper installation, security, and operating clearance. Verify tail rotor guard mounting screw shanks clear push-pull tube.

_____ **Tail Rotor Drive Shaft Hanger Bearing & Hanger:**
Inspect condition. Inspect bearing for obvious damage. Verify integrity of bearing seals. Verify bearing's inner race-to-drive shaft torque stripe is intact and no evidence of bearing slippage on shaft. Verify no bends, cracks, corrosion, or obvious damage to hanger and hanger mount to tailcone bulkhead. Verify proper installation, security, and smooth operation.

_____ **Tail Rotor Drive Shaft Damper Assembly:**
Inspect condition. Inspect bearing for obvious damage. Verify integrity of bearing seals. Inspect bearing housing for cracks or corrosion. Verify bearing's inner race-to-drive shaft torque stripe is intact and no evidence of bearing slippage. Verify no bends, cracks, corrosion or obvious damage to friction arms and (Teflon) bearings. Verify proper installation, security, and smooth operation.

_____ **Tailcone Interior:**
Inspect condition. Verify no nicks, scratches, dents, cracks, corrosion, fretting or loose rivets. Verify no cracks where damper assembly mounts to tailcone. Verify no excessive wear in bulkhead bushings from push-pull tubes. Retrieve and discard trapped debris.

5-45 100-Hour / Annual Inspection (continued)

TAILCONE & STABILIZERS (continued)

_____ **Tailcone Exterior:**
Inspect condition. Refer to § 53-41. Inspect tailcone exterior for nicks, scratches, dents, cracks, corrosion, fretting or loose rivets. Verify no obstructions in drain hole at forward edge of each bay (except forward bay).

_____ **F050-2 Horizontal Stabilizer (if installed):**
Inspect condition. Verify no nicks, scratches, dents, cracks, corrosion, fretting, or loose rivets. Verify security.

_____ **Empennage:**
Inspect condition. Verify no nicks, scratches, dents, cracks, corrosion, fretting, or loose rivets on skins or near attachment points. Check tail rotor skid for evidence of tail rotor or tail rotor skid strike. Refer to § 5-61 for tail rotor skid strike inspection criteria. Verify no obstructions in lower vertical stabilizer and skid drain holes. Verify proper installation and security.

_____ **Aft Navigation Light:**
Inspect condition. Verify no cracks where aft navigation light mounts to empennage. Verify lens cleanliness, clarity, and security. Verify proper operation.

_____ **Antennas:**
Inspect condition. Verify no cracks where antennas mount to tailcone. Verify security.

_____ **Anti-Collision Light:**
Inspect condition. Verify no cracks where anti-collision light mounts to tailcone. Verify lens cleanliness, clarity, and security. Verify proper operation.

_____ **Tail Rotor Visual Warning Guard:**
Inspect condition. Verify no cracks where guard mounts to tailcone. Inspect guard welds for cracks or corrosion. Verify security.

_____ **Wiring:**
Inspect condition. Verify no loose, chafed, or broken wires or terminals. Verify neatness, proper routing and installation, and security.

_____ **Fasteners & Torque Stripes:**
Inspect condition. Verify proper installation and security of fasteners. Renew deteriorated torque stripes per Figure 5-1.

_____ **Close & Secure:**
Verify foreign objects are removed. Verify equipment security. Verify cleanliness of interior and of inspection plugs. Install plugs removed in preceding steps. Verify security.

5-45 100-Hour / Annual Inspection (continued)

TAIL ROTOR & TAIL ROTOR GEARBOX

NOTE
Verify proper hardware installation securing plastic inspection cover. Longer screws could contact aft flex coupling and yoke.

_____ **Plastic Inspection Cover:**
Clean cover and inspect condition. Replace as required.

_____ **C947-3 (Tail Rotor Drive) Plate Assembly, Aft:**
Refer to Figure 5-4B. Inspect condition. Verify no distortion, nicks, scratches, cracks, corrosion, and fretting. If fretting is detected, contact RHC Technical Support. Verify bonded washers are installed on both sides of each flex plate ear. Verify proper installation, security, and operating clearance.

_____ **Tail Rotor Gearbox Input Yoke:**
Inspect condition. Verify no cracks, corrosion, or fretting. Inspect weld for cracks or corrosion. Verify proper installation, security, and operating clearance.

_____ **Tail Rotor Gearbox:**
Inspect condition. Verify gearbox-to-tailcone mounting security. Verify no leakage at input or output seals, chip detector, vent plug-filler assembly, or sight gage. With ship on level ground, verify correct oil level and oil cleanliness through sight gage and adjust or flush as required. Inspect Telatemp per § 5-35. Inspect output shaft for nicks, scratches, dents, cracks, or corrosion. Verify proper installation of safety wire (if installed). Gearbox S/Ns 9684 & prior: using 10X magnification, visually inspect four curved surfaces on input cartridge per Figure 5-4C; if cracking is detected, remove gearbox from service and perform C148 Bulkhead Inspection per § 5-75.

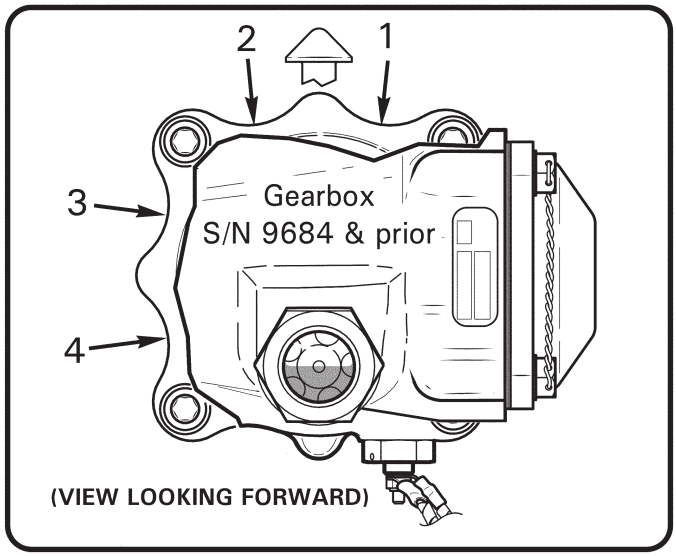


FIGURE 5-4C TRGB INPUT CARTRIDGE INSPECTION

5-45 100-Hour / Annual Inspection (continued)

TAIL ROTOR & TAIL ROTOR GEARBOX (continued)

_____ **Pitch Control Bearing Assembly & Aft Bellcrank:**

Inspect condition. Verify pitch control assembly has less than 0.25 inch rotational play measured at pitch link attach bolt. Verify no leakage at bearing seals. Verify no nicks, scratches, dents, cracks, or corrosion on pitch control housing or bellcrank. Inspect bellcrank spherical bearings per § 5-33. Inspect spherical bearing atop stud protruding from underside of pitch control for cracks. Verify proper installation, security, and smooth actuation without binding.

NOTE

B345-4 tail rotor pitch links can have different shaft diameters (0.250 inch or 0.300 inch). Balance tail rotor per § 18-20 if a different shaft diameter pitch link is installed.

_____ **Pitch Links:**

Inspect condition. Inspect rod ends per § 5-33. Remove and reinstall pitch links with outboard end inboard and inboard end outboard as required to obtain maximum service life; additionally, an optional A215-012 O-ring may be installed on A115-1 spacer under bolt head at pitch control. Reinstall chordwise weights at respective attachment points for balance purposes. Verify proper installation of A115-1 spacers. Verify proper installation, security and operating clearance.

_____ **Tail Rotor Blades:**

Refer to R66 SB-41. Inspect condition. Refer to § 64-30 for damage limits and repair. Verify no looseness between spherical bearing outer races and root fittings. Inspect bearings per § 5-33. Verify no obstructions in blade tip drain holes. Verify proper installation, security, and pitch change operation.

WARNING

Structural damage may occur if compressed air is applied to blade tip drain holes.

_____ **Tail Rotor Hub:**

Inspect condition. Verify no nicks, scratches, gouges, dents, cracks, or corrosion. Inspect elastomeric teeter bearings per § 5-34. Teeter rotor hub and verify teeter bearing bolt, spacers, and nuts do not rotate. Verify hub teeters smoothly. Verify proper installation and security of blade bolts.

_____ **Wiring:**

Inspect condition. Verify no loose, chafed, or broken wires or terminals. Verify neatness, proper routing and installation, and security.

_____ **Fasteners & Torque Stripes:**

Inspect condition. Verify proper installation and security of fasteners. Renew deteriorated torque stripes per Figure 5-1.

5-45 100-Hour / Annual Inspection (continued)

MAST FAIRING

_____ **Mast Fairing:**

Inspect condition. Verify no nicks, scratches, dents, cracks, corrosion, fretting, or loose rivets. Verify no yielding or cracking of pitot line and fuel vent restraint assembly.

_____ **Upper & Lower Ribs:**

Inspect condition. Inspect for cracks especially around mast tube attachments. Verify proper installation and security of ribs and lower rib clamp.

_____ **Vertical Push-Pull Tubes:**

Examine accessible portion with inspection light and mirror. Inspect condition per § 5-32. Verify no nicks, scratches, chafing, dents, cracks or corrosion. Inspect rod end bearings per § 5-33; verify rod ends are centered and evaluate torque stripes per § 5-36. Check witness holes for proper thread engagement. Verify proper installation, security, and operating clearance.

_____ **Pitot Tube & Line:**

Inspect pitot lines for obstructions, cracking, chafing, pinching or kinking. Verify integrity of pitot and static line connections. Verify proper routing and security of pitot tube and line. Verify no cracks where pitot tube mounts to mast fairing. Verify no obstructions in pitot tube.

_____ **Fuel Vent Weldment and Tygon® Tubes:**

Inspect condition. Verify no obstructions, cracking, chafing, pinching or kinking in plastic tubes. Inspect vents for cracks or obvious damage. Verify proper installation and security of safety wire.

5-45 100-Hour / Annual Inspection (continued)

MAST FAIRING (continued)

_____ **Swashplate Upper Scissors:**
Inspect condition. Verify bearing play within limits as shown in Figure 5-4D. Closely examine scissor linkage while a second person raises and lowers collective stick. Verify bolts and washers rotate together through full control travel without binding. Inspect fork assembly rod end bearing per § 5-33; verify rod end is centered and evaluate torque stripes per § 5-36. Verify proper installation of all parts, part security, and operating clearance.

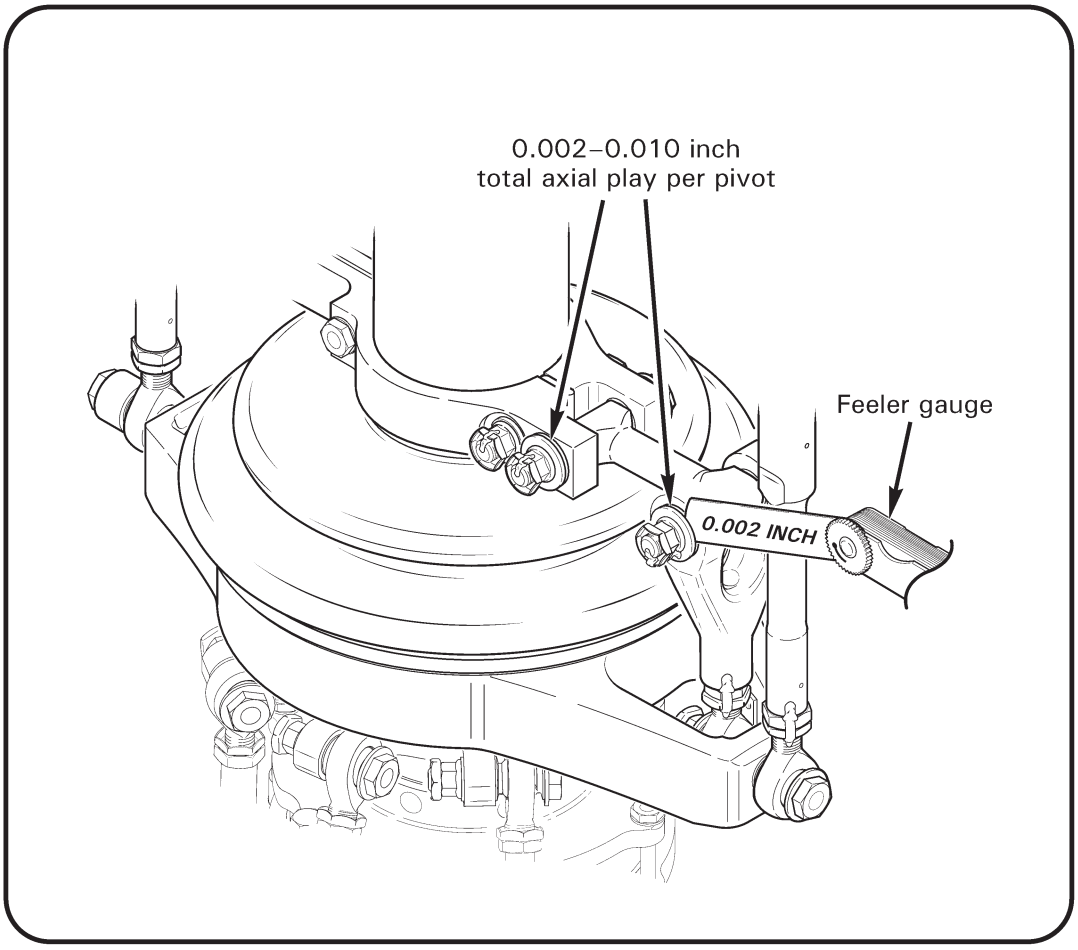


FIGURE 5-4D MEASURING UPPER SWASHPLATE SCISSOR AXIAL CLEARANCE
(MEASURE LOWER SWASHPLATE SCISSOR AS SHOWN)

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5-45 100-Hour / Annual Inspection (continued)

MAST FAIRING (continued)

_____ **Swashplate Lower Scissors:**
Inspect condition. Verify bearing play within limits as shown in Figure 5-4D. Closely examine scissor linkage while a second person raises and lowers collective stick. Verify bolts and washers rotate together through full control travel without binding. Inspect fork assembly rod end bearing per § 5-33; verify rod end is centered and evaluate torque stripes per § 5-36. Verify proper installation of all parts, part security, and operating clearance.

_____ **Swashplate Slider Tube:**
Inspect condition. Verify no cracks, corrosion, or loose rivets near tube base flange. Verify no damage or wearing through of anodized coating on tube surface. When viewed under 10X magnification, minute "checkerboarding" of anodized surface is normal.

_____ **Swashplate Interior:**
Remove swashplate boot lower ty-rap. Lift boot from swashplate, and verify no boot defects, tears, or material deterioration. Examine swashplate interior with inspection light and mirror. Verify no corrosion or debris between main rotor drive shaft and inside of slider tube. Install swashplate boot lower ty-rap. Verify proper boot position, security, and operating clearance.

_____ **Swashplate:**
Inspect condition. Verify no nicks, scratches, gouges, dents, cracks, or corrosion. Verify 0.020 inch maximum radial play between swashplate ball and slider tube. Rotate rotor by hand and verify no rough or dry bearings. Verify proper operation.

_____ **Swashplate Shimming:**
Closely examine area between lower swashplate and swashplate ball while a second person slowly raises and lowers collective stick. Verify synchronized movement of swashplate ball with swashplate when swashplate reverses direction.

> NOTE
>
> Swashplate shimming is required when swashplate ball lags collective inputs, indicating axial play. Shim swashplate per Chapter 67.

_____ **Fasteners & Torque Stripes:**
Inspect condition. Verify proper installation and security of fasteners. Renew deteriorated torque stripes per Figure 5-1.

_____ **Close & Secure:**
Verify foreign objects are removed. Verify equipment security. Verify cleanliness of interior and of access fairing. Close mast fairing and verify security.

5-45 100-Hour / Annual Inspection (continued)

ROTOR HUB & MAIN ROTOR BLADES

_____ **Teeter Stops & Teeter Stop Brackets:**
Inspect both urethane teeter stops and associated stainless steel brackets. Replace stops if cracked due to weathering. If stops evidence pinching and/or brackets are deformed, excessive MR teetering has occurred; contact RHC Technical Support for further instructions.

_____ **Droop Stops:**
Cone and support both MR blades. Inspect curved bottoms of both aluminum droop stops where spindle tusks contact; replace any droop stop if wear exceeds 0.030 inch.

_____ **Hub:**
Inspect condition. Verify no nicks, scratches, gouges, dents, cracks, or corrosion. Verify no brown or black residue indicating bearing wear. Verify proper installation and security.

_____ **Hinge Bolts:**
Inspect condition. Check blade hinge friction by lifting blades until spindle tusks clear droop stops. Hold one blade level and cone opposite blade; rotor hub must not teeter as blade is coned. Repeat check on opposite blade. Verify cotter pins are installed and secure. Verify bolt heads and nuts are torque striped to thrust washers.

_____ **Pitch Links & Rod Ends:**
Inspect condition. Inspect rod end bearings per § 5-33; verify rod ends are centered and stamped nut & jam nut torque stripes are acceptable. Verify correct orientation of C115-1 spacers. Check witness holes for proper thread engagement. Verify proper installation of safety wire (if applicable).

_____ **Blade Spindles & Root Fittings:**
Inspect condition. Verify no obvious damage to visible portions of blade spindles and pitch horns. Verify no obvious damage to, and no missing paint from, blade root fittings, especially in area adjacent to inboard edges of blade skin and doublers.

_____ **Blade Boots:**
Inspect condition. Verify no boot defects or oil leakage. Verify boot security. Verify clearance from hub assembly through full control travel.

_____ **Fasteners & Torque Stripes:**
Inspect condition. Verify proper installation and security of fasteners. Renew deteriorated torque stripes per Figure 5-1.

_____ **Main Rotor Blade Leading Edge Care:**
Perform main rotor blade leading edge care per § 62-53.

_____ **Main Rotor Blade Tip Maintenance:**
Perform main rotor blade tip maintenance per § 62-60.

5-50 2000-Hour/15-Year Inspection

NOTE

Fuel bladder(s) are on condition.

NOTE

KI-6602 2000-Hour Inspection Kit contents are available online at https://robinsonheli.com for review.

NOTE

15-Year Inspection is only required for helicopters that have accumulated 15 years in service and less than 2000 hours time in service since new, since last 2000-hour inspection, or since last 15-year inspection (previously 12-year inspection).

1. Refer to helicopter maintenance records and § 4-30; replace life-limited parts, or next higher assemblies, as required.
2. Refer to helicopter maintenance records and § 1-92; perform additional component maintenance, as required.
3. Visually inspect stabilizers. Verify no cracks, corrosion, loose rivets, dents, or deformation.
4. Remove fuel bladder(s) per Chapter 28. Visually inspect interior and exterior. Verify no corrosion, residue, microbial growth, or damage to fabric. Visually inspect adjacent structure for evidence of bladder leakage. Replace roll-over vent valve O-rings and packings per § 28-11. Remove any foreign object debris. Install bladder(s) per Chapter 28.
5. Perform (engine driveline) forward flex plate shimming per § 63-11 and (tail rotor driveline) intermediate flex plate shimming per § 65-30.
6. Fill and bleed hydraulic system per § 12-34 as required.
7. Drain engine oil per § 12-60; utilize a suitable clean container if reuse of oil is intended. Using a borescope or remote camera, inspect oil tank internal baffle and welds for signs of cracking. If cracks are detected, or if a broken baffle is found, replace oil tank per § 79-20. Add engine oil per § 12-60.
8. Perform main rotor flight control and blade angle rigging per §§ 18-30 and 18-40.
9. Perform tail rotor flight control and blade rigging per §§ 18-50 and 18-60.
10. If installed, perform leak check of air conditioning system per § 12-83.
11. Perform 100-Hour / Annual Maintenance and Inspection per § 5-45.
12. Weigh helicopter per § 8-20.

5-50 2000-Hour/15-Year Inspection (continued)

13. Balance tail rotor per § 18-20. Track and balance main rotor per § 18-10. Perform flight checks per § 5-43.
14. Drain and flush tail rotor gearbox per § 12-23.
15. Make appropriate maintenance record entries. Enter maintenance performed (such as part replacement, equipment adjustments, weighing, servicing, and lubrication) and inspection data. Data must include a description of (or reference to data acceptable to the Administrator) the work performed, date, helicopter total time in service, signature, certificate type and certificate number of person approving aircraft return to service.

5-51 C258-5 & -8 Main Rotor Pitch Link Assembly Inspection

1. Temporarily mark each pitch link and associated swashplate ear with unique identifiers, such as different colors and/or X & O. Measure and record overall lengths of both links.
2. Remove pitch links.
3. R66 Service Letters SL-54 and SL-20 refer. Disassemble pitch links, keeping parts from each link separate from the other.
4. Evaluate rod ends per § 5-33 and replace as required.
5. Visually inspect parts with 10X magnification for obvious damage. Replace damaged parts.
6. Visually inspect interior of barrels with borescope for obvious damage. Replace damaged barrels.
7. Apply a light coat of A257-2 or -22 oil to rod end threads and assemble pitch links; adjust to recorded lengths. Torque jam nut & adjacent stamped nut per § 20-32. Special torque self-locking 21FKF-813 or 27FKF-813 jam nut per § 20-33.
8. Install pitch links to associated swashplate ear and, if installed, main rotor blade. Torque fasteners per § 20-32 and torque stripe per Figure 5-1.

5-52 Swashplate Assembly Detail Inspection

1. Remove swashplate assembly per § 67-40.
2. Remove both pitch links and upper A205-7 fork assembly from swashplate.
3. Determine revision ("REV") letters on C017-6 swashplate data plate. If revision letters are "AD" or subsequent, proceed to step 2. If revision letters are "AA", "AB", or "AC", perform R66 Service Bulletin SB-30.
4. Refer to Figure 12-7. Remove (10) NAS1352 screws (with washers) securing C206-2 & C200-3 retainers to upper swashplate. Remove both retainers and C219-3 spacer and set aside.
5. Remove inner screws securing sleeve to lower swashplate. Remove sleeve, shims, and ball and set aside.
6. Using a 0.006 inch feeler gage, gently pry up outer edge of upper C217-1 seal and expose top ball bearing. Discard upper seal.
7. Clean all parts, including C203-5 yokes.
8. Visually inspect cleaned parts with 10X magnification, to include blind screw-holes in upper & lower swashplates, for obvious damage. Replace swashplate assembly if damage is detected on either upper or lower swashplate. Replace damaged parts.
9. Perform swashplate tilting friction adjustment per § 67-41 step 4.
10. Lubricate swashplate bearings per § 12-90 steps 7 thru 11. Install new upper seal during procedure.
11. Remove rod end form upper fork. Using non-metallic tools, remove majority of sealant in threaded hole of fork. Visually inspect parts with 10X magnification for obvious damage. Replace damaged parts. Assemble upper fork assembly and adjust pivots' center-to-center dimension to 3.85 ± 0.03 inches. Standard torque jam nut & stamped nut per § 20-32 and torque stripe per Figure 5-1. Fill exposed cavity with B270-13 sealant.
12. Remove lower A205-7 fork assembly from non-rotating scissors and clean. Remove rod end from lower fork. Visually inspect parts with 10X magnification for obvious damage. Replace damaged parts. Assemble lower fork assembly and adjust pivots' center-to-center dimension to 3.70 ± 0.03 inches. Standard torque jam nut & stamped nut per § 20-32 and torque stripe per Figure 5-1. Install lower fork on C204-2 arm and standard torque bolt per § 20-32. Install stamped nut, standard torque per § 20-32, and torque stripe per Figure 5-1.
13. Install swashplate assembly per § 67-40 Part B.

5-53 Landing Gear Assembly Detail Inspection

1. Inspect cross tubes per § 32-20.
2. Remove landing gear per § 32-10.
3. Remove left skid tube, and remove rain cap and skid extension from tube.
4. Remove fasteners securing struts to cross tubes. Using a twisting motion, remove left struts from cross tubes.
5. Remove right skid tube, and remove rain cap and skid extension from tube.
6. Using a twisting motion, remove right struts from cross tubes.
7. Clean cross tubes, struts, and skid tubes.
8. Visually inspect interior of struts with borescope (or similar) for obvious damage. Visually inspect exterior of struts using minimum 3X magnification for obvious damage. Any corrosion on, or adjacent to, a weld requires corrosion & paint removal followed by MPI. Upon favorable MPI results, apply § 20-76 powder coat.
9. Refer to § 32-30. Visually inspect interior of skid tube with borescope (or similar). Visually inspect exterior of parts using minimum 3X magnification. As required, touch-up coatings with § 20-75 primers and § 20-77 paints.
10. Visually inspect interior of cross tubes with borescope (or similar) for obvious damage. Visually inspect exterior of cross tubes using minimum 3X magnification for obvious damage. As required, touch-up coatings with § 20-75 primers and § 20-77 paints.
11. Assemble landing gear.
12. Install landing gear per § 32-10.

5-54 Hydraulic Reservoir Detail Inspection

1. Perform hydraulic system drain and flush per § 12-33 step 1. Remove D516-1 cap.
2. Refer to Figure 5-5. Suction remaining fluid using suitable, clean, plastic tube (do not use metal tool). Wipe out any residue from both traps with clean, foam-tip swab.
3. Inspect interior of reservoir for corrosion with borescope (or similar). Replace reservoir if corrosion is detected.
4. Perform hydraulic system drain and flush per § 12-33, steps 2 thru 12.

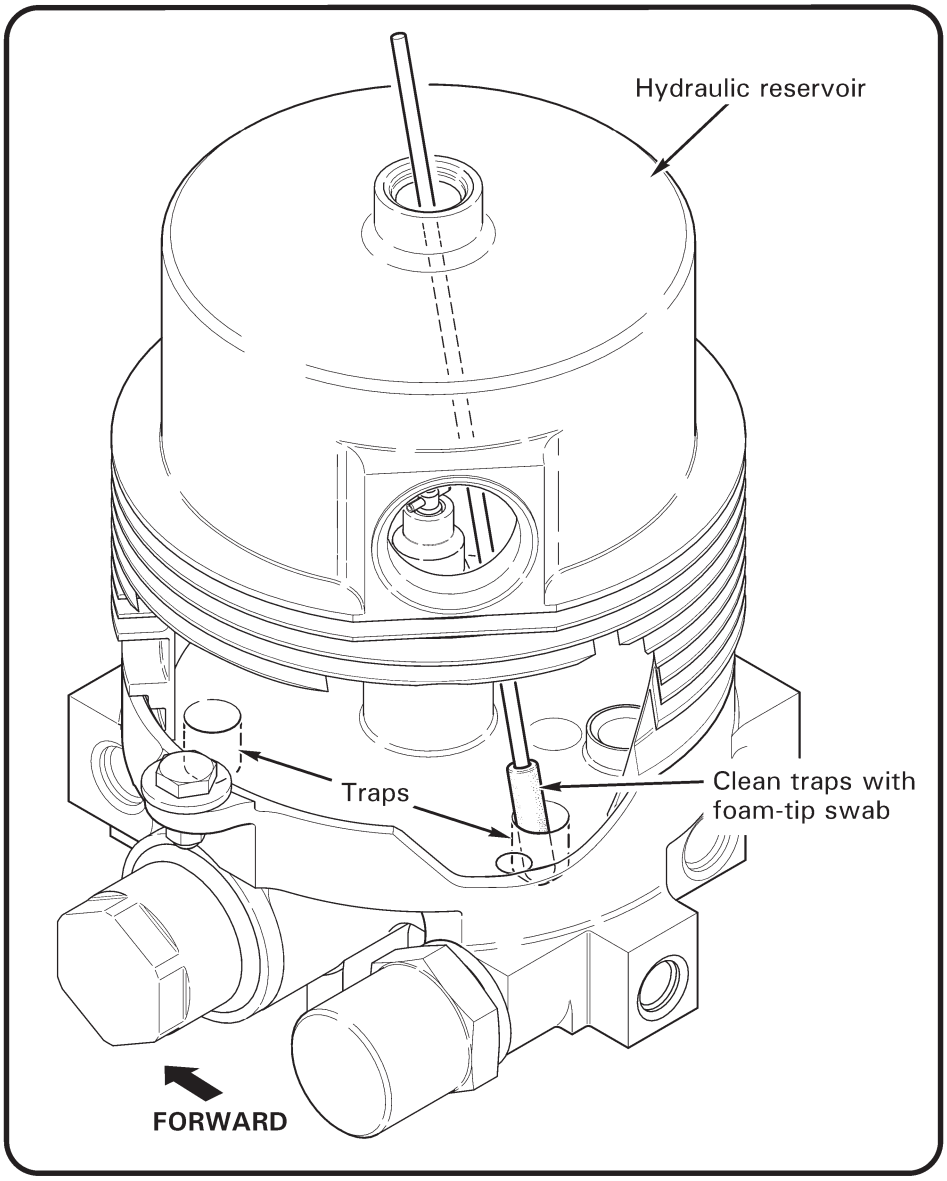


FIGURE 5-5 HYDRAULIC RESERVOIR INSPECTION

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8-30 Fixed Ballast

8-31 Nose Ballast

NOTE

Maximum allowable nose ballast is 15.00 lb.

CAUTION

Changing fixed ballast amount affects helicopter empty weight & center of gravity (CG). If helicopter empty weight & CG historical data is suspect, weigh helicopter per § 8-22.

1. Open or remove console assembly per § 95-10.
2. Refer to Figure 8-4. Remove hardware securing A941-5 or -6 ballast plate(s), if installed, to F361-1 panel.
3. Remove or install ballast plates per calculations performed in § 8-22. Select NAS6603 bolt length to meet torque requirements per § 20-30 Part E. Install hardware, standard torque bolts per § 20-32, and torque stripe per Figure 5-1.
4. Install or close console assembly per § 95-10. Verify security.
5. Reweigh and/or calculate basic empty weight and CG per § 8-22.
6. Revise Weight and Balance Record in R66 Pilot's Operating Handbook (POH) Section 6 to reflect ballast removal or installation using the following data:

Item	Weight	Longitudinal Arm	Longitudinal Moment	Lateral Arm	Lateral Moment
Nose ballast	0–20.00 lb	5.15 in.	Variable	0.00 in.	0.00 in.-lb

8-32 Empennage Ballast

NOTE

Approved materials are listed in § 20-70.

CAUTION

Changing fixed ballast amount affects helicopter empty weight & center of gravity (CG). If helicopter empty weight & CG historical data is suspect, weigh helicopter per § 8-22.

A. Removal

CAUTION

Maximum allowable empennage ballast is 9.0 lb (except Police and E.N.G. Versions). One upper and one lower weight are required. Available combinations provide total weight of 3.0, 6.0, & 9.0 lb.

1. Remove D079-1 tail rotor guard per § 53-50.
2. Leaving NAS6606-78 bolts installed in C004-2, C004-3, or F004-2 empennage assembly, remove stamped nuts, nuts, washers, and lower D301-2, -4, or -8 ballast weight from empennage assembly.
3. Remove one bolt then rotate upper ballast weight to expose empty bolt hole. Install NAS6606-47 bolt and associated hardware in exposed hole, finger tight (install [1] or [2] NAS1149F0663P washers as required under nut to meet torque requirements per § 20-30 Part E).
4. Remove second bolt & upper ballast weight from empennage assembly. Install NAS6606-47 bolt and associated hardware (install [1] or [2] NAS1149F0663P washers as required under nut to meet torque requirements per § 20-30 Part E). Standard torque bolts securing empennage to C148-5 bulkhead per § 20-32. Install stamped nuts and standard torque per § 20-32, do not torque stripe at this time.
5. As required, solvent-clean upper & lower surfaces of empennage assembly around and between attach bolts. Apply light coat zinc-chromate or epoxy primer to noted surfaces and hardware. Apply topcoat as desired.
6. Apply torque stripe to hardware per Figure 5-1.
7. Install tail rotor guard per § 53-50.
8. As required, weigh helicopter or calculate basic empty weight & CG per § 8-22.
9. Revise Weight and Balance Record in R66 Pilot's Operating Handbook (POH) Section 6 to reflect ballast removal using Table 8-1.

20-33 Special Torques

Special torques supersede standard torques listed in § 20-32.

NOTE

1. Torque values are in inch-pounds unless otherwise specified.
2. Torque values include nut self-locking torque.
3. Increase torque values 10% if torqued at bolt head.
4. Wet indicates threads lubricated with A257-9 anti-seize.
5. For elbow and tee fittings which require alignment, torque to indicated value, then tighten to desired position.
6. Tolerance is ± 10% unless range is specified.
7. Unless otherwise specified, thread sizes 8-32 and smaller are not used for primary structure and do not require control of torques.

AREA	FASTENER	TORQUE (IN.-LB)
AIR CONDITIONING (OPTIONAL EQUIPMENT)	(1) D795-8 line assembly, B-nuts	150
	(1) D799-2 switch assembly	90
	(1) D799-3 switch assembly	90
	(1) D799-9 switch assembly	90
	(1) G783 condenser, dessicant cap	100
	(1) G784-1 evaporator assembly, inlet B-nut to TXV	210
	(1) G794-1 hose assembly, B-nuts	210
	(1) G794-2 hose assembly, B-nuts	210
	(1) G794-3 hose assembly, B-nuts	150
	(1) G810-1 line assembly, B-nuts	210
	(1) G811-1 line assembly, B-nuts	150
	(2) AN924-8D nuts	360
	(8) MS27039C1-07 screws at condenser fans	20
	(2) 91292A135 screws (apply one drop B270-20 adhesive to threads)	70
COOLING SYSTEM (ENGINE AND MAIN ROTOR GEARBOX OILS)	(1) B289-2 bolt, drain	70
	(1) B563-2 sight gage	150
	(1) D205-19 hose assembly, B-nuts	200
	(1) D205-20 hose assembly, B-nuts	200
	(1) F723-1 line assembly, B-nuts	675
	(1) F723-2 line assembly, B-nuts	245
	(1) F723-3 line assembly, B-nuts	245
	(1) F723-4 line assembly, B-nuts	245
	(1) F724-1 line assembly, B-nuts	120
	(1) F724-2 line assembly, B-nuts	285
	(1) F724-3 line assembly, B-nuts	285
	(2) AN815-8D unions, on F649-1 oil cooler	300
	(2) AN832-8D unions, at firewall	230-260

20-33 Special Torques (continued)

AREA	FASTENER	TORQUE (IN.-LB)
COOLING SYSTEM (ENGINE & MAIN GEARBOX OILS) (Cont'd)	(1) AN832-10D union, at firewall	330-360
	(2) AN924-8D nuts, at firewall	150
	(1) AN924-10D nut, at firewall	180
	(2) AN924-6D nuts, securing F823-1 thermostat assembly to firewall	120
	(2) AS5169D04L fitting, on F649-1 oil cooler	58
	(1) MS28034-1 oil temperature sender, to tank	120
DOOR HINGES AND GAS SPRINGS	(16) MS51861-37C screws, securing door hinge assemblies	36
	(2) 21FKF-518 (or 94830A030) nuts, securing G904-1 gas spring ball studs at baggage compartment door	100
	(2) 21FKF-518 (or 94830A030) nuts, securing D575-1 gas spring ball studs at aft doors	100
	(2) C394-2 ball stud, at forward doors, to frame (B270-10 on thds)	150
	(2) D575-2 and (2) D575-3 ball joints, at forward doors' D573-4 rods	37
DRIVE SYSTEM	(2) F650-1 bolt, forward main rotor gearbox and G201 frame mounts	65 FT-LB wet from bolt head
	(2) F650-2 bolt, aft main rotor gearbox and G201 frame mounts	65 FT-LB wet from bolt head
ELECTRICAL SYSTEM	(2) MS21044B5 nut, securing A780 cable to B415-2 relay	80
	(1) NAS6605-3 bolt, securing B237-8 battery ground cable to G131-5 terminal assembly	70
EMPENNAGE	(8) NAS6604-6 bolts, securing vertical stabilizers to upper horizontal stabilizer	185
	(1) NAS1352-3-14P screw, securing guard assembly blocks to lower vertical stabilizer	40
	(2) AN814-10D plugs (upper weight only)	100
ENGINE CONTROLS	(1) Fuel control unit (FCU) lever nut	40-50
	(1) Power turbine governor (PTG) lever nut	40-60
	(4) MS21042L3 nut, securing control wires	25-30
ENGINE INDUCTION	(1) A457-16 fitting, IBF filter FMA line	20
	(1) A457-17 fitting, IBF filter FMA line	60
	(1) A457-18 fitting, IBF filter FMA line	3
	(1) G738-1 nozzle, compressor service	30
	(1) AN316-7R nut, compressor service line	150
	(1) AN929-4 cap, compressor service line	60
FUEL SYSTEM	(1) A761-2 valve, sump (B270-6 sealant on threads)	60
	(1) B254-3 strainer, fuel bladder outlet	150
	(1) B283-12 hose assembly, fuel valve to fuel pump inlet, B-nuts	110-130
	(5) B289 bolts, fuel sender	37
	(1) F550 fuel sender center stud nut	11
	(1) B330-6 stamped nut at fuel sender center stud	9

22-16-2 Garmin FCS – Calibration (continued)

D. Magnetometer Calibration

NOTE
Garmin FCS magnetometer calibration requires simultaneous GMU 44 or GMU 44B magnetometer calibration; refer to § 97-62 Part F Magnetometer Calibration.

NOTE
Perform this procedure during flight check.

1. If not previously accomplished, perform Pitch/Roll Offset Calibration per § 22-16-2 Part C.
2. Ensure aircraft is positioned on a compass rose heading 360° (magnetic north), or select a magnetically clean location and use a calibrated sight compass.
3. Power on GMC 605H mode controller in configuration mode per § 22-16-1 Part A.
4. Refer to Figure 22-7. Navigate to GFC menu→CALIBRATE group→MAG group, then highlight 1/11 (page).
5. Use the NOSE UP/DN thumbwheel to view each page and verify all pre-calibration steps are completed.
6. Press VS key to indicate START TEST.
7. Scroll down one notch to highlight START TEST and press VS key to start.
8. With appropriately rated person at controls, start helicopter. Have pilot hover→turn 30°→land helicopter as required by GMC 605H mode controller's on-screen instructions; repeat until GMC 605H indicates that calibration is complete.
9. Press VS key to complete calibration when indicated.
10. Have pilot complete flight check if required, or land and shutdown helicopter.

22-16-3 Garmin FCS – Inspections

A. Scheduled Inspections

INSPECTION	PROCEDURE	INTERVAL
Visual	Visually inspect all servos, mode controller, collective sensor, tubes & rod ends, and attached LRUs for security. Inspect visible wiring; verify security and no damage. Verify shear fuses on pitch and roll servos are intact with no signs of wear. Gently pull collective sensor cable slightly and allow to retract slowly to verify operation.	Every 100-hour/annual inspection.
AHRS magnetic field model update	Contact Garmin for new magnetic field model.	Every 5 years.
Electrical bonding	Disconnect battery per § 96-10. Disconnect G323-1 or -2 harness from component to be tested. Using milliohm meter, verify: • GMC-to-avionics tray is < 5.0 mOHM, • Avionics tray-to-cabin ground stud is < 5.0 mOHM, or • Servo-to-cabin ground stud is < 2.5 mOHM. Repair electrical bonding as required. Connect G323-1 or -2 harness. Connect battery per § 96-10.	Every 600 flight hours or 5 years, whichever occurs first.
Pitot-static system	Perform pitot-static system checks per § 95-30.	Every 2 years.
Servo arm friction verification	Perform servo arm friction adjustment per § 22-12-4 to verify friction.	Every 600 flight hours or 2 years, whichever occurs first.

B. Special Inspections

INSPECTION	PROCEDURE	INTERVAL
Lightning strike	Perform visual inspection. Perform electrical bonding inspection. Inspect equipment for signs of arcing. Inspect OAT probe for damage. Perform GMC 605H and GSU 75H magnetometer calibration.	After suspected lightning strike.
Electrical bonding	Disconnect battery per § 96-10. Disconnect G323-1 or -2 harness from component to be tested. Using milliohm meter, verify: • GMC-to-avionics tray is < 5.0 mOHM, • Avionics tray-to-cabin ground stud is < 5.0 mOHM, or • Servo-to-cabin ground stud is < 2.5 mOHM. Repair electrical bonding as required. Connect G323-1 or -2 harness. Connect battery per § 96-10.	After component was removed or replaced.
Hard landing	Perform visual inspection per Part A.	After hard landing.
Display or status LED inoperative	Display or FCS status LED are inoperative, remove and install new GMC 605H per § 22-14.	On condition.

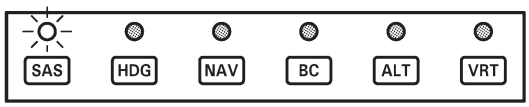
22-27 HeliSAS – Maintenance (continued)

A. Ground Checks (continued)

6. Refer to step 2. Engage SAS and verify SAS disengages when control panel's SAS button is depressed or when AP OFF button on the cyclic grip is depressed. Verify four beeps in headset and control panel SAS LED is white, other LEDs are dark:



FOUR BEEPS IN HEADSET

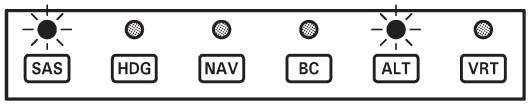


SAS LED IS WHITE, OTHER LEDS DARK

7. Perform pitot system leak test per § 95-30 and, while airspeed indicates > 50 knots: Engage SAS and ALT modes. Verify no sound in headset and SAS & ALT LEDs are green, other LEDs are dark:



NO SOUND

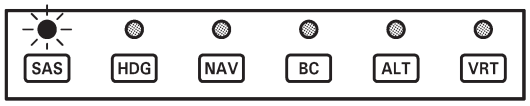


SAS & ALT LEDs ARE GREEN, OTHER LEDS DARK

8. Disengage ALT mode. Verify no sound in headset and SAS LED is green, other LEDs are dark:



NO SOUND



SAS LED IS GREEN, OTHER LEDS DARK

9. Refer to steps 7 & 8. Engage SAS and HDG modes. Verify no sound in headset and SAS & HDG LEDs are green, other LEDs are dark. Disengage HDG mode. Verify no sound in headset and SAS LED is green, other LEDs are dark.

10. Engage SAS, HDG, and ALT modes. Verify no sound in headset and SAS, HDG, and ALT LEDs are green, other LEDs are dark. Press AP OFF button on cyclic grip. Verify no sound in headset and SAS LED is green, other LEDs are dark.

11. Engage SAS, HDG, and ALT modes. Verify no sound in headset and SAS, HDG, and ALT LEDs are green, other LEDs are dark. Press AP OFF button twice on cyclic grip. Verify four beeps in headset and SAS LED is white, other LEDs are dark.

22-27 HeliSAS – Maintenance (continued)

B. Troubleshooting

CAUTION

Adjustment to autopilot equipment is not permitted.

PROBLEM	ACTION
Control panel lights do not illuminate or flash when master switch is turned on.	Verify computer is getting power.
	Return computer to RHC.
System does not enter standby-mode (lights flash continuously).	Verify attitude indicator bank angle less than 6 degrees.
	Verify attitude indicator output between 13 and 14 pins is less than 0.3 volts at connector.
	Check wiring between attitude indicator and computer.
	Contact RHC Technical Support.
SAS does not engage when TRIM button depressed for longer than 1.25 seconds; pressing TRIM button does not reset reference attitude; pressing TRIM button does not reset reference altitude in altitude hold.	Check wiring between TRIM button and computer.
	Verify integrity of TRIM button.
	Return computer to RHC.
SAS does not disengage when cyclic grip AP OFF button depressed.	Check wiring between AP OFF button and computer.
	Verify integrity of AP OFF button.
	Return computer to RHC.
SAS does not engage or disengage when control panel buttons pressed.	Engage and/or disengage SAS using cyclic grip buttons. If system responds properly, failure is in control panel or associated wiring to computer.
	Contact RHC Technical Support.
SAS does not hold pitch attitude, but holds roll attitude or vice versa.	Check servo-to-cyclic linkage.
	Check wiring between faulty servo and computer.
	Return faulty servo and computer to RHC.
SAS disengages unintentionally (accompanied by four beeps in headset).	Contact RHC Technical Support.
Autopilot mode disengages unintentionally, and reverts to SAS mode (accompanied by single beep in headset).	Determine if navigation signal may have gone invalid due to operational reason.
	Check wiring between appropriate instrument/ avionics and computer.
	Check instrument/avionics for failure flags (steady and intermittent).
Cyclic vibrates erratically, SAS does not disengage.	Manually override SAS, system should disengage automatically.
	Contact RHC Technical Support.
Helicopter enters low frequency pitch oscillation when ALT engaged; helicopter diverges nose-up or nose-down when ALT engaged.	Return computer to RHC.

25-77 Left-Seat Instruments

A. Schematic

Refer to Figure 98-30 for copilot instruments installation wiring schematic.

B. Removal

1. Turn battery switch off and pull out (10 amp) HOOK RELEASE circuit breaker on circuit breaker panel.
2. Remove hardware securing G135-5 cover and G138-4 face to F353-1 panel and remove face with attached F600-2 torquemeter and T1221MK900C010 MGT gage (and 210-095-00 load meter).
3. Disconnect G140 harness assembly from torquemeter and/or MGT gage, as required. Remove hardware securing torquemeter and/or MGT gage to face, as required, and remove torquemeter and/or MGT gage.

C. Installation

1. Turn battery switch off and pull out (10 amp) HOOK RELEASE circuit breaker on circuit breaker panel.
2. Install hardware securing F600-2 torquemeter and T1221MK900C010 MGT gage to G138-4 face. Connect G140 harness assembly to torquemeter and/or MGT gage, as required. Verify security.
3. Install hardware securing face with attached torquemeter and MGT gage (and 210-095-00 load meter) to F353-1 panel; install hardware securing G135-5 cover to face and panel. Verify security.

D. Scheduled Inspections

Refer to § 5-45 100-Hour/Annual inspection.

E. Special Inspections

Refer to § 95-45 Part F for torquemeter and § 95-48 Part F for MGT gage special inspections.

25-78 Doors with Bubble Windows and Fans

A. Schematic

Refer to Figure 98-31 for bubble door fans installation wiring schematic.

B. Removal

Bubble Door

1. Turn battery switch off and pull out AUX PWR (10 amp) circuit breaker on circuit breaker panel.
2. Disconnect D580 fan assembly wiring from G140-9 harness assembly at connectors.
3. Refer to § 52-10. Pull D573-4 rod up and off of arm assembly ball joint.
4. Remove rings from door hinge pins, lift pins up from door frame hinge assemblies, and remove door.
5. Perform weight and balance for doors off operation per Part E as required.

Fan Assembly

1. Turn battery switch off and pull out AUX PWR (10 amp) circuit breaker on circuit breaker panel.
2. Disconnect D580 fan assembly wiring from G140-9 harness assembly at connectors.
3. Remove hardware securing fan assembly to door stiffener and remove fan.

C. Installation

Bubble Door

WARNING

Failure to install a ring in each door's two hinge pins may allow door to depart aircraft in flight.

1. Turn battery switch off and pull out AUX PWR (10 amp) circuit breaker on circuit breaker panel.
2. Refer to § 52-10. Align and insert door hinge pins in door frame hinge assemblies.
3. Align D573-4 rod with arm assembly ball joint and push down to lock.
4. Install rings in door hinge pins.
5. Connect D580 fan assembly wiring to G140-9 harness assembly at connectors; verify security.
6. Push in AUX PWR (10 amp) circuit breaker on circuit breaker panel and turn battery switch on. Verify proper operation of fan. Turn battery switch off.
7. Perform weight and balance for doors on operation per Part E as required.

25-79 Skid-Mounted Mirrors (continued)

D. Configurations for Flight (continued)

2. Configuration for Flight with Skid-Mounted Mirror(s) Installed

a. Remove screws from skid tube(s) and install skid-mounted mirror(s) per Part B.

b. Revise Weight and Balance Record in R66 Pilot's Operating Handbook (POH) Section 6 to incorporate the following data:

Right Skid-Mounted Mirror Add:

Weight	Long. Arm	Long. Moment	Lat. Arm	Lat. Moment
0.80 lb	32.00 in.	25.60 in.-lb	41.00 in.	32.80 in.-lb

Left Skid-Mounted Mirror Add:

Weight	Long. Arm	Long. Moment	Lat. Arm	Lat. Moment
0.80 lb	32.00 in.	25.60 in.-lb	–41.00 in.	–32.80 in.-lb

25-80 Cabin Interior Hardpoint Installation

A. Removal

Peel back headliner and remove hardware securing G949-2 ring to F087-1 frame; remove ring.

B. Installation

Peel back headliner and install hardware securing G949-2 ring to F087-1 frame. Standard torque fasteners per § 20-32 and torque stripe per Figure 5-1. Position seam of grommet at top of hole, in-line with middle fastener.

25-81 Arm Rest

NOTE

Flight with G135-7 support assembly & 2454K71KNOB removed is permissible. No change to helicopter weight and balance.

A. Removal

Remove 2454K71KNOB knob. Remove hardware securing G135-7 support assembly to G135-8 cover assembly and remove support.

B. Installation

Position G135-7 support assembly on G135-8 cover assembly and install hardware; verify security. Install 2454K71KNOB knob. Verify proper operation; position support as desired and tighten knob.

25-90 Cyclic Guard

NOTE

Flight with handle assembly & mounting hardware removed or with handle in either position is permissible.

A. Description

The optional cyclic guard is a bar that extends from the inboard corner of the left front seat to the instrument console. It is intended to act as a barrier to help prevent inadvertent interference with the cyclic control. The guard also provides a hand grip for a passenger's right hand.

In order to access the under seat compartment with the guard installed, pull the silver spring knob at the forward end of the guard and allow the aft end to rotate down away from the seat hinge. To re-secure the guard, lift the aft end and allow the spring knob to lock back in place.

It is recommended that the guard be installed whenever a non-pilot passenger occupies the left front seat. A pilot flying from the left seat may find that the guard contacts the right leg when feet are on the pedals. The guard should be removed prior to flight if the pilot finds it objectionable.

B. Removal

1. Extend G721-1 guard assembly into upper position and remove hardware securing guard to left hand forward seat. Pull plunger and slide guard forward out of G722-6 plate.
2. Open console assembly (ref. § 95-10). Remove hardware securing plate to lower console and remove plate.

C. Installation

1. Open console assembly (ref. § 95-10). Position G722-6 plate on lower console and install hardware; verify security. Close and secure console.
2. As required, install 56-99-196-20 plunger in G721-1 guard assembly; install supplied sleeve wet with B270-11 adhesive and special torque to 25 in.-lb.
3. Pull plunger, insert guard assembly in plate and slide aft. Extend guard assembly into upper position and install hardware securing G722-5 mounts to left hand forward seat. Verify security.
4. Actuate guard assembly and verify proper operation. As required, adjust set screw in plate to reduce forward/aft play (plunger must fully engage).

D. Scheduled Inspections

Refer to § 5-45 100-Hour/Annual Inspection.

CHAPTER 53

FUSELAGE

53-00 Description

The R66 is a five-place, single main rotor, single engine helicopter constructed primarily of metal and equipped with skid type landing gear.

The primary fuselage structure is welded steel tubing and riveted aluminum sheet. The tailcone is a monocoque structure in which aluminum skins carry most primary loads. Fiberglass and thermoplastics are used in secondary cabin structure and in various ducts and fairings.

Several cowl doors provide access to the drive system, engine, engine oil tank, fuel filler cap, and fuel sump drain. A right-side door provides access to the main baggage compartment. Removable panels and cowlings allow additional access to controls and other components for maintenance.

The instrument console hinges up and aft for instrument and avionics access. The battery is installed behind an access panel under the left front seat, or in the main baggage compartment, depending on aircraft configuration.

The engine is located aft of the main baggage compartment. The engine compartment is isolated from the rest of the airframe by stainless steel firewalls in front of and above the engine.

53-10 Cabin Assembly

The cabin assembly is a non-field-replaceable assembly.

53-11 Repair

1. Vertical firewall replacement must be performed by an appropriately rated Repair Station using a calibrated jig. Firewall repairs may be accomplished in accordance with U.S. FAA Advisory Circular 43.13-1B Section 4-59. Firewall material is 0.016 inch, type 301, one-quarter hard corrosion-resistant (CRES) steel.
2. Keel panel replacement must be performed by an appropriately rated Repair Station using a calibrated jig. Keel panel repairs may be accomplished in accordance with U.S. FAA Advisory Circular 43.13-1B Sections 4-58 and 4-59. Keel panel material is 0.025 inch, 2024-T3 clad aluminum sheet.
3. To preserve crashworthiness, seat assembly maintenance is limited to replacement only.

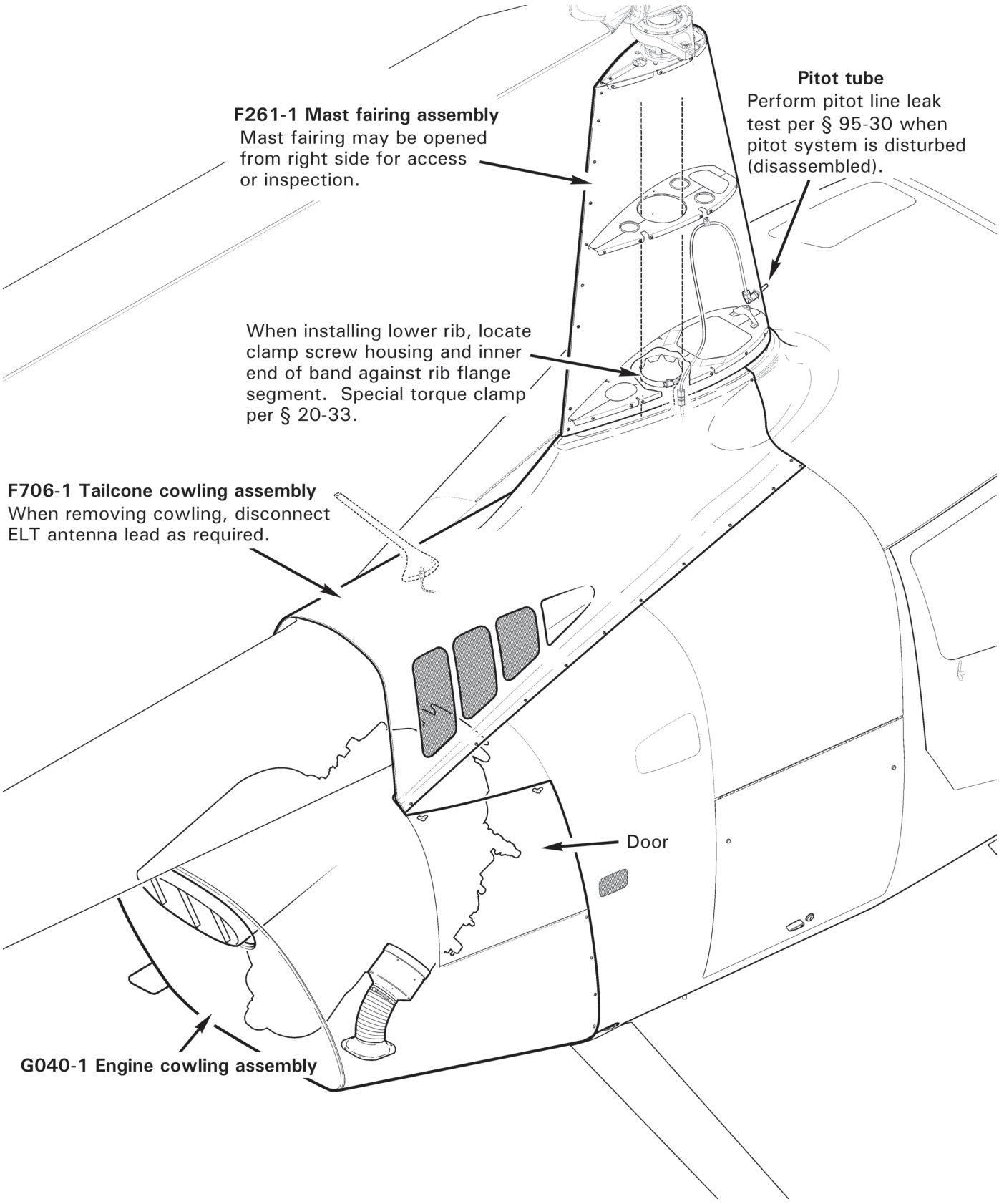


FIGURE 53-1 FAIRING, COWLINGS, AND PANELS

53-20 Fairing, Cowlings, and Panels

CAUTION

Mast fairing, cowlings, and panels must be installed for flight.

53-21 Engine Cowling

A. Removal

1. Refer to Figure 53-1. Open G040-1 engine cowling assembly right and left doors.
2. Loosen clamp securing starter-generator hose to air inlet. Slide hose off of inlet.
3. Remove screws securing cowling to fuselage, unfasten cowling doors, and remove cowling.

B. Installation

1. Refer to Figure 53-1. Position G040-1 engine cowling assembly on helicopter, fasten cowling doors, and install screws securing cowling to fuselage.
2. Slide starter-generator hose onto air inlet and tighten clamp. Close right and left doors.
3. Ensure G039 ring is centered on exhaust weldment within 0.1 inch. Remove and reinstall/replace ring as required.

53-22 Mast Fairing

A. Opening and Closing

1. Refer to Figure 53-1. Remove right-side screws securing F261-1 mast fairing assembly at aft, vertical seam.
2. Remove right-side screws securing fairing to ribs. Keep fairing from springing open and minimize strain on nutplates by holding fairing closed until all right-side screws are removed. Slowly open fairing.
3. Hold fairing closed. Install right-side screws securing fairing to ribs, and screws securing fairing at aft, vertical seam.

B. Removal

1. Open mast fairing assembly per § 53-22 Part A.
2. Disconnect (pitot system) 15-4-N-O union near G201-1 (servo support) frame assembly. Cap fitting and plug line.
3. Remove remaining screws securing fairing to ribs and remove fairing.

53-22 Mast Fairing (continued)

C. Installation

1. Refer to Figure 53-1. Install left-side screws securing F261-1 mast fairing assembly to ribs.
2. Remove cap and plug and connect (pitot system) 15-4-N-O union near G201-1 (servo support) frame assembly.
3. Hold fairing closed. Install right-side screws securing fairing to ribs, and screws securing fairing at aft, vertical seam.
4. Perform pitot line leak test per § 95-30.

53-23 Tailcone Cowling

A. Removal and Installation

1. Refer to Figure 53-1. Thru left access door, disconnect ELT antenna lead from antenna mounted to F706-1 tailcone cowling assembly, as required.
2. Remove screws securing cowling to fuselage and remove cowling.
3. Reinstall cowling and install screws securing cowling to fuselage.
4. Connect ELT antenna lead to cowling thru left access door, as required.

53-24 Access and Inspection Panels

Refer to § 6-70 for access and inspection panel location and illustration.

90-10 C023-34 Tailcone Assembly

Refer to Figure 90-1. The C023-34 tailcone assembly has provisions for two upper-mounted antennas and two lower-mounted antennas and NAV. Refer to § 6-80 for antenna locations.

Refer to § 53-40 for tailcone assembly maintenance procedures.

90-20 C060-3 Interior Light Installation

Refer to Figure 90-1. The C060-3 interior light installation is installed above the observer's seat, and has a floor-mounted switch.

A. Schematic

Refer to Figure 90-2 for C060-3 interior light installation wiring schematic.

90-30 C069 Cyclic Control Assembly

Refer to Figure 90-1. On earlier Police helicopters, the C069-9 cyclic control assembly was modified for clearance with the LCD monitor. The copilot removable grip assembly (transmit wiring) was omitted and the C058-11 grip weldment was plugged. A second grip was installed on the cyclic stick.

Refer to § 67-10 for cyclic control and grip assembly maintenance procedures.

A. Schematic

Refer to Figure 90-3 for C058-11 grip assembly wiring schematic.

90-40 C430-2 Five-Point Harness Installation (Optional)

Refer to Figure 90-1. The C430-2 five-point harness installation was optional equipment for earlier Police helicopters, and now is optional for all R66 Turbines (see § 6-10 for version descriptions).

Refer to § 25-10 for seat harness maintenance procedures.

90-50 C599 Airspeed Indicator

Police version airspeed limitations (130 knot Vne, KM/H) differ from standard version helicopters (140 knot Vne, KM/H) due to external equipment. On earlier Police helicopters, two indicators were available: one with kilometers per hour for primary markings and one with miles per hour for primary markings. On later Police helicopters, only an indicator with miles per hour for primary markings is approved.

Refer to § 95-42 for maintenance procedures. Refer to § 90-150 or § 90-155 EFIS Installation for equipment removal instructions prior to removing instrument face.

90-60 C813 Transceiver Installation (Optional)

A. Description

The Technisonic TDFM-600/6000/7000 series (C813-2; 5-band) and TDFM-9000 series (C813-4 and C813-5; 6-band) airborne transceivers are wired through the Technisonic A711L series audio control panel to allow for separate and simultaneous operation on each band. The C813-2 transceiver (earlier Police helicopters) is located at the observer's station. The C813-4 and C813-5 transceivers (separate installations) are located in the instrument panel for pilot and observer access.

B. Schematic

Refer to Figure 90-4 for C813-2 transceiver installation wiring schematic.

Refer to Figure 90-5 for C813-4 transceiver installation wiring schematic.

Refer to Figure 90-6 for C813-5 transceiver installation wiring schematic.

C. Removal

C813-2 (Technisonic TDFM-600) Transceiver:

1. Refer to Figure 90-1. Turn battery & avionics switches off and pull out (7.5 amp) circuit breaker at panel.
2. Remove screws securing D413-2 cover to D413-1 box assembly.
3. Disconnect D613-4 harness assembly from C813-2 transceiver.
4. Release slotted turnlock fasteners securing transceiver to box assembly and remove transceiver.

C813-4 (Technisonic TDFM-9000) Transceiver:

1. Refer to Figure 90-1. Turn battery & avionics switches off and pull out (10 amp) circuit breaker at panel.
2. Release slotted turnlock fasteners securing C813-4 transceiver to avionics tray and remove transceiver.

C813-5 (Technisonic TDFM-9000) Transceiver:

1. Refer to Figure 90-1. Turn battery & avionics switches off and pull out (10 amp) circuit breaker at panel.
2. Remove screws securing G413-14 cover to G070 console assembly and remove cover.
3. Disconnect G458-1 harness assembly and antenna cables from C813-5 transciever.
4. Release slotted turnlock fasteners and remove transceiver.

90-150 F075-2 EFIS Installation

90-151 C831-12, -13, & -14 (GTN-XXX Series) GPS/NAV/COM Installation

A. Description

The Garmin GTN 6XX/7XX-series GPS for the Police version with Garmin G500H integrated display system is installed in the pilot-side console location.

B. Maintenance

Refer to § 97-31 for maintenance procedures.

90-152 G060-4 (Garmin G500H) Upper Console Assembly Installation

A. Opening Console

1. Remove Garmin GDU 620 display per § 97-75.
2. Remove C813-4 transceiver per § 90-60.
3. Remove perimeter screws securing instrument face to console.
4. Disconnect instrument pitot-static lines. Plug lines.
5. Remove screws securing console assembly to keel panels and hinge console aft.

B. Securing Console

1. Hinge console assembly forward and install screws securing console to keel panels.
2. Position instrument face in helicopter, remove plugs, and connect pitot-static lines.
3. Install perimeter screws securing face to console. Verify security.
4. Install C813-4 transceiver per § 90-60.
5. Install Garmin GDU 620 display per § 97-75.
6. Perform pitot-static system leak check per § 95-30.

90-155 F075-8 EFIS Installation

90-156 F817-9 (Garmin G500H) GDU 1060 Display (R66 Police) Installation

A. Description

The Garmin GDU 1060 Display is installed in the pilot-side console location for the Police Version F075-8 EFIS installation.

B. Maintenance

Refer to § 97-76 for maintenance procedures.

90-157 F818-11 (G070 Console) GTN 6XX-series GPS/NAV/COM Installation

A. Description

The Garmin GTN 6XX-series GPS/NAV/COM is installed in the G070 upper console location for the Police Version F075-8 EFIS installation.

B. Maintenance

Refer to § 97-31 for maintenance procedures.

90-158 G070-7 (8-Instrument, High) Upper Console Assembly

A. Removing Upper Console

1. Remove C813-5 transceiver per § 90-60.
2. Remove GTN 650Xi GPS/NAV/COM per § 97-31.
3. Remove perimeter screws securing instrument face to console.
4. Disconnect instrument pitot-static lines. Plug lines.
5. Remove hardware securing console assembly to keel panels and lower console. Disconnect airframe harnesses from console harnesses and remove console.

B. Installing Upper Console

1. Connect airframe harnesses to console harnesses and position upper console on lower console and keel panels. Install hardware; verify security.
2. Position instrument face in helicopter, remove plugs, and connect pitot-static lines.
3. Install perimeter screws securing face to console. Verify security.
4. Install GTN 650Xi GPS/NAV/COM per § 97-31.
5. Install C813-5 transceiver per § 90-60.
6. Perform pitot-static system leak check per § 95-30.

92-10 A826-18 Transceiver Installation (FM1)

A. Description

The A826-18 (Kenwood TK-7180 series or TK-8180 series) FM transceiver is installed in the avionics console and includes an antenna, associated wiring, and mounting hardware. The transceivers are used by the pilot and/or crew to communicate with ground-based media personnel.

B. Schematic

Refer to Figure 92-3 for A826-18 transceiver installation wiring diagram.

C. Removal

1. Refer to Figure 92-1. Turn battery & avionics switches off and pull out FM1 (10 amp) circuit breaker at panel.
2. Loosen radio key securing A824-18 transceiver to upper console radio tray.
3. Remove transceiver from tray. Disconnect G459 harness assembly from back of transceiver and remove transceiver.

D. Installation

1. Refer to Figure 92-1. Turn battery & avionics switches off and pull out FM1 (10 amp) circuit breaker at panel.
2. Connect G459 harness assembly to A824-18 transceiver and verify security. Install transceiver in upper console radio tray.
3. Tighten radio key securing transceiver to tray. Verify equipment security.
4. Push in FM1 (10 amp) circuit breaker at panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Kenwood TK-7180/TK-8180 FM Transceiver Instruction Manual. Turn battery & avionics switches off.

E. Scheduled Inspections

Every 100-hour or annual inspection, inspect A824-18 transceiver for proper installation (refer to R66 Illustrated Parts Catalog Chapter 92) & proper operation per Part D steps 4 and 5.

F. Special Inspections

1. Refer to Figure 92-1. Turn battery & avionics switches off. Open circuit breaker panel.
2. As required, remove A824-18 transceiver per Part C. Inspect condition of and verify no obvious damage to transceiver, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel. Install transceiver per Part D if removed.

92-20 C023-24 Tailcone Assembly

A. Description

Refer to Figure 92-1. The C023-24 tailcone assembly has wiring provisions for the ENG version's D097-38 HD micro camera (tail).

B. Maintenance Procedures

Refer to § 53-40 for tailcone assembly maintenance procedures.

92-30 C599-7 Airspeed Indicator

A. Description

Refer to Figure 92-1. C599-7 (120 knot V_{NE}, KM/H) airspeed indicator replaces C599-2 (140 knot V_{NE}, KM/H) airspeed indicator.

B. Maintenance Procedures

Refer to § 95-42 for airspeed indicator maintenance procedures.

92-40 C720-1 Support Installation

A. Removal

Refer to Figure 92-1. Remove hardware securing C719-1 support to C242 skid tube and remove support.

B. Installation

Install hardware securing C719-1 support to C242 skid tube, special torque bolt per § 20-33, and torque stripe per Figure 5-1.

92-50 HD Micro Camera Installations

A. Description

The micro camera system consists of three small cameras and their control units. The micro cameras are mounted at the tip of the horizontal stabilizer, on the windshield bow, and in the center of the cabin. The control units are located in the rear equipment console. The horizontal stabilizer camera is enclosed in a weatherproof case.

B. Schematic

Refer to Figure 92-4 for D097 HD micro camera installation wiring diagram.

92-60 F003-19 Seat Removal

Refer to Figure 92-1. ENG version helicopters have no aft center seat installed. The following equipment is omitted: F628-4 connector assembly, center F628-6 buckle assembly, F931-1 seat assembly, A752-3 angle, & (2) NAS1352-04-8 screw. Associate hardware is replaced or omitted; refer to R66 Illustrated Parts Catalog for installation information.

92-70 Landing Gear Assembly

A. Description

Refer to Figure 92-1. The F014-5 extended landing gear raises the forward cross tube approximately 2 inches higher off the ground, providing additional ground clearance for optional equipment installations that project below the fuselage.

For ground handling, a second set of wheel installation supports is provided forward on the landing gear skids. For ground handling using MT950 towcart, install wheels at forward supports and use cart at aft cross tube as indicated on cart instructions (online at https://robinsonheli.com). For ground handling without towcart, wheels may be installed at all four support locations.

B. Maintenance Procedures

Refer to Chapter 32 for landing gear assembly maintenance procedures (identical to standard gear maintenance procedures unless otherwise specified). Forward wheel support maintenance procedures are located in § 92-40.

92-80 F060 Remote Transmit Switch Installations

A. Description

Refer to Figure 92-1. A handheld remote switch is installed at the co-pilot seat, allowing the occupant to transmit on the radio selected without touching the flight controls, or when the co-pilot flight controls are removed.

The switch plugs into a socket on the base of the seat.

B. Schematic

Refer to Figure 98-24 thru 98-25B for F060 intercom system installation wiring diagram.

92-90 F075-1 EFIS Installation

A. Description

Refer to Figure 92-1. The R66 ENG version is equipped with the Garmin G500H Electronic Flight Instrument System (EFIS).

B. Maintenance Procedures

Refer to § 97-62 for Garmin G500H EFIS maintenance procedures.

92-100 F082-21 Fairing Installation

A. Description

Refer to Figure 92-1. Extended landing gear F082-21 strut fairings are longer than but are otherwise identical to standard strut fairings. F082-21 fairing installation replaces F082-1 fairing installation.

B. Maintenance Procedures

Refer to § 32-40 fairing assemblies for maintenance procedures.

92-110 F461-4 Cover Assembly

Refer to Figure 92-1. Refer to R66 Illustrated Parts Catalog Chapter 6 for access and inspection panel locations. F461-4 cover assembly replaces F461-1 cover assembly.

92-120 G197-13 Window

A. Description

Refer to Figure 92-1. The G197-13 window illuminates the ENG version instrument console for night lighting. G197-13 window replaces G197-9 window.

B. Maintenance Procedures

Refer to § 33-21 for panel light maintenance procedures. Adjust window laterally as required to ensure even light spread on console.

CHAPTER 95

INSTRUMENT SYSTEM

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CHAPTER 95

INSTRUMENT SYSTEM

95-00 Description

Standard primary instruments include an airspeed indicator, engine (N_2) and rotor dual tachometer, altimeter, torquemeter, and magnetic compass. Engine gages include an N_1 tachometer, measured gas (turbine) temperature, oil pressure, oil temperature, and fuel quantity. Also standard are a clock, an ammeter, a digital outside air temperature gage/voltmeter, and an hourmeter. An additional hourmeter is located outboard of the pilot's seat. Both hourmeters require main gearbox oil pressure to activate. The outboard hourmeter is collective activated and may be used to determine time in service.

For instrument panels with electronic flight displays, a P/N D327 light filter may be used to reduce reflections in the windshield at night. The light filter is installed by clipping it to the front of the display. Filter use is at pilot discretion.

The pitot-static system supplies air pressure to operate the airspeed indicator, altimeter, and vertical speed indicator. The pitot tube is located on the front edge of the mast fairing. The static sources are located on each side of the cabin, aft of the rear doors.

Water can be drained from pitot-static lines by removing the plastic drain plugs which are accessible through the aft inspection panel on the underside of the cabin. Draining lines should be required only if the airspeed indicator or altimeter appears erratic.

Pitot and static sources should be inspected frequently for bugs or other obstructions.

95-10 Console Assemblies

95-11 Upper Consoles

A. Description

Upper console assemblies may be "opened" or removed for maintenance. Upper consoles with instrument panels that do not include Electronic Flight Displays (EFDs) or other avionics may be "opened" per Part B. Upper consoles with EFDs or other avionics can be removed per Part C. Refer to Figures 95-1 thru 95-5 for typical upper console assemblies.

B. Opening and Closing Console

1. Remove (4) screws securing upper console to sides of lower console and hinge console aft.
2. To close, hinge upper console forward and install (4) screws securing upper console to lower console.

C. Removing Console

1. Remove EFD and/or other avionics if installed per Chapter 97. For Police or ENG versions, also refer to Chapters 90 or 92, respectively.
2. Remove HeliSAS control panel if installed and located in upper instrument console (not required if control panel is located at top of avionics stack).
3. If required for access to pitot-static lines, remove perimeter screws securing instrument face to console.
4. Disconnect instrument pitot-static lines. Plug lines. Temporarily secure face to console, if removed.
5. Remove screws securing console assembly to forward keel panels and lower panel. Remove console and disconnect console harness from airframe harness.

D. Installing Console

1. Connect console assembly harness to airframe harness and install screws securing console to forward keel panels and lower panel.
2. If removed, position instrument face in console. Remove plugs and connect pitot-static lines.
3. As required, install perimeter screws securing face to console. Verify security.
4. Install HeliSAS control panel, if removed.
5. Install EFD and/or avionics per Chapter 97, if removed. For Police or ENG versions, also refer to Chapters 90 or 92, respectively.
6. Perform pitot-static system leak check per § 95-30.

95-12 Lower Consoles

A. Description

Lower consoles may contain various instruments, avionics equipment, or switches. Refer to the appropriate sections for installed instruments or avionics equipment.

B. Opening Lower Console

1. Disconnect battery per § 96-10.
2. Refer to appropriate sections for avionics installed in lower console and remove avionics.
3. Remove screws securing F640 face assembly to lower console.
4. Remove screws securing F444 cyclic box cover to cyclic box. Pull cover aft to allow clearance for face assembly removal.
5. Pull face assembly aft to access electrical wiring. Disconnect wiring from switches and instruments attached to face assembly and remove face assembly from helicopter.
6. Refer to appropriate sections for remote-mounted avionics installed in trays and remove avionics.
7. If installed, remove (2) SI413 hole plugs on sides of lower console. Remove hardware securing avionics trays to sides of lower console.
8. Pull avionics trays aft from lower console.

C. Closing Lower Console

1. Disconnect battery per § 96-10.
2. Position avionics trays in lower console. Install hardware securing avionics trays to sides of lower console. Install (2) SI413 hole plugs.
3. Install remote-mounted avionics in avionics trays per appropriate sections.
4. Connect electrical wiring to switches and instruments attached to face assembly and position face assembly on lower console. Install screws securing face assembly. Verify security.
5. Position F444 cyclic box cover on cyclic box. Install screws securing cover to cyclic box. Verify security.
6. Refer to appropriate sections for avionics removed and reinstall in lower console.
7. Connect battery per § 96-10.

95-20 Instrument Markings

See R66 Pilot's Operating Handbook (POH) Section 2 for instrument markings.

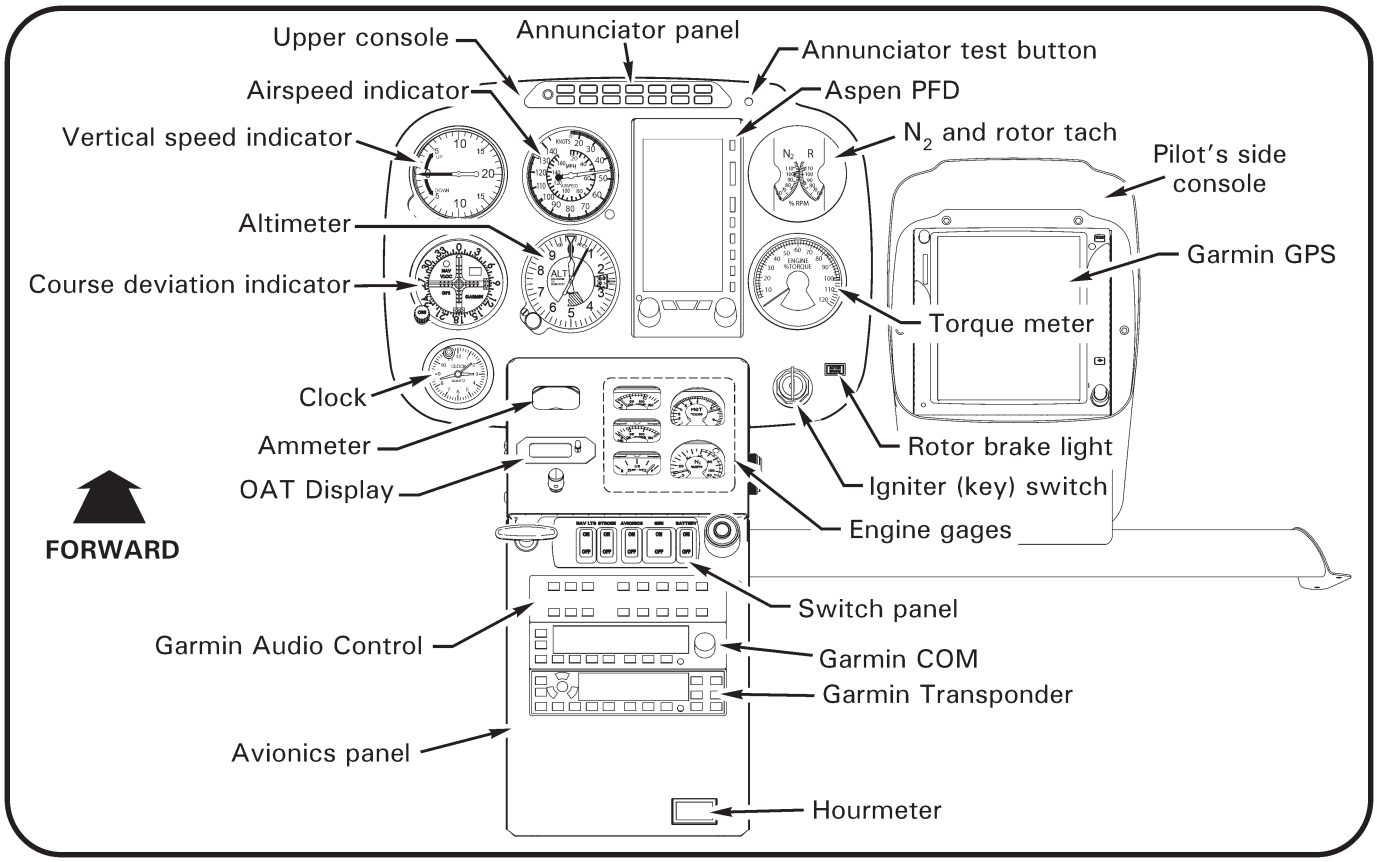


FIGURE 95-1 EIGHT-INSTRUMENT CONSOLE WITH ASPEN PFD

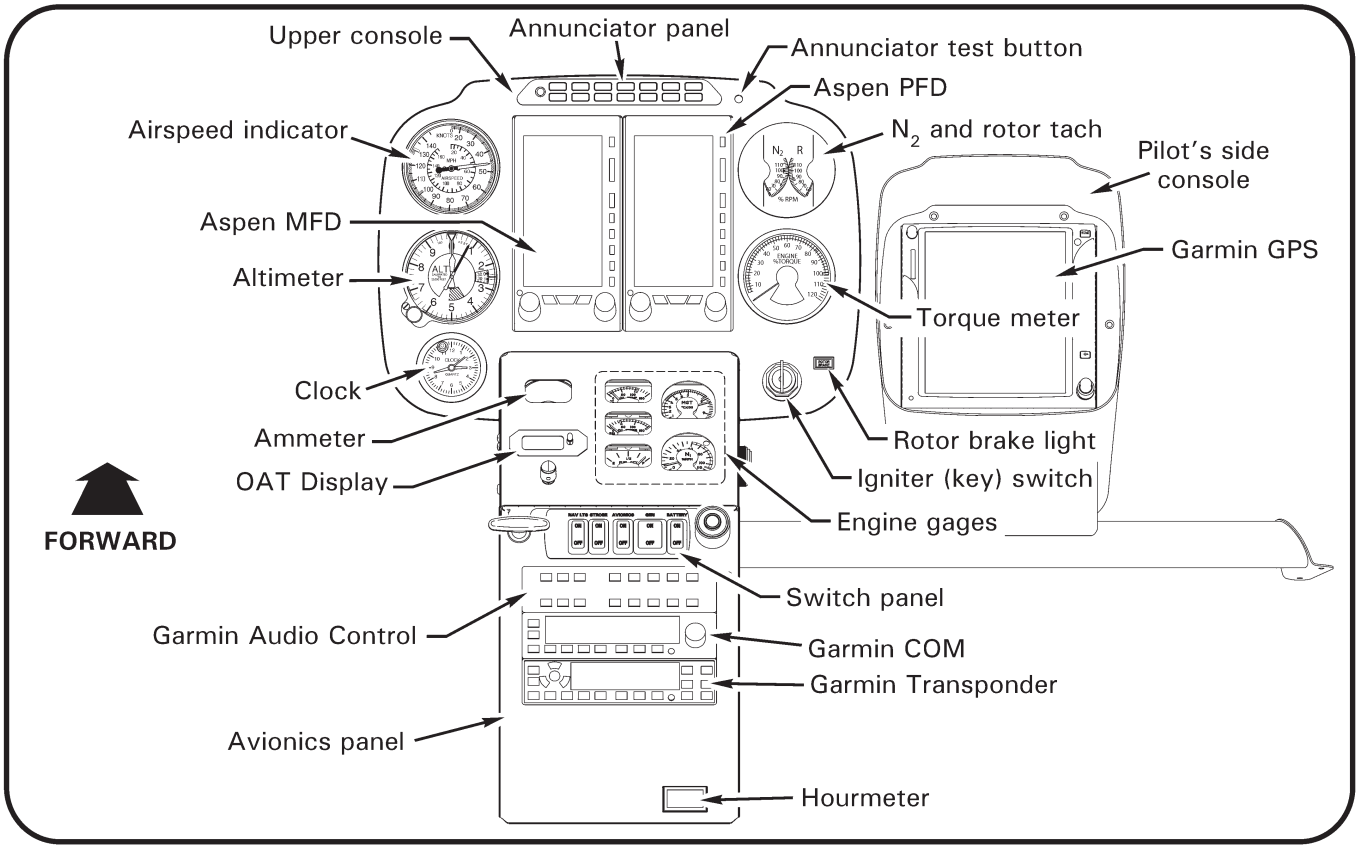


FIGURE 95-2 EIGHT-INSTRUMENT CONSOLE WITH ASPEN PFD AND MFD

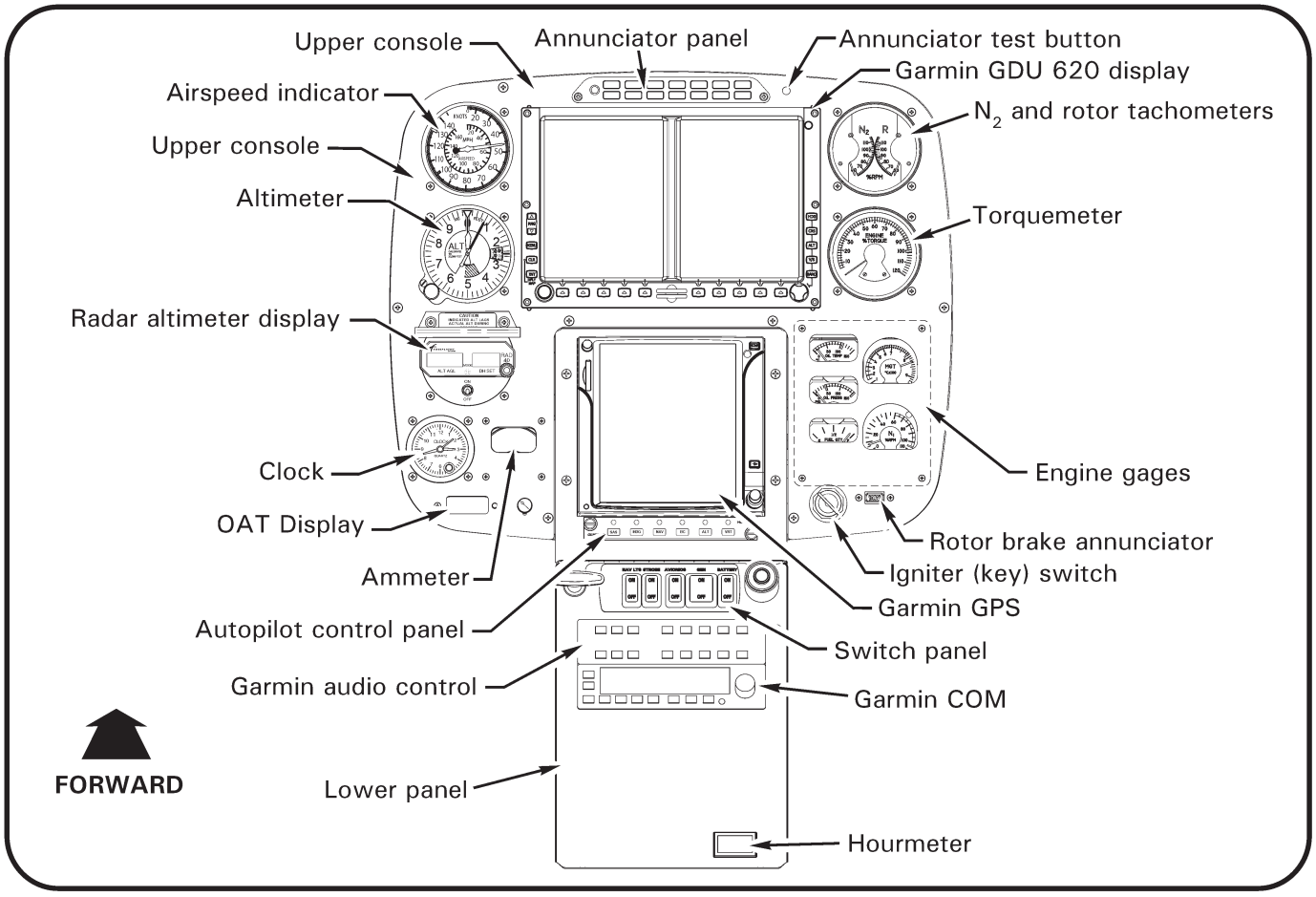


FIGURE 95-3 GARMIN G500H UPPER CONSOLE WITH GDU 620

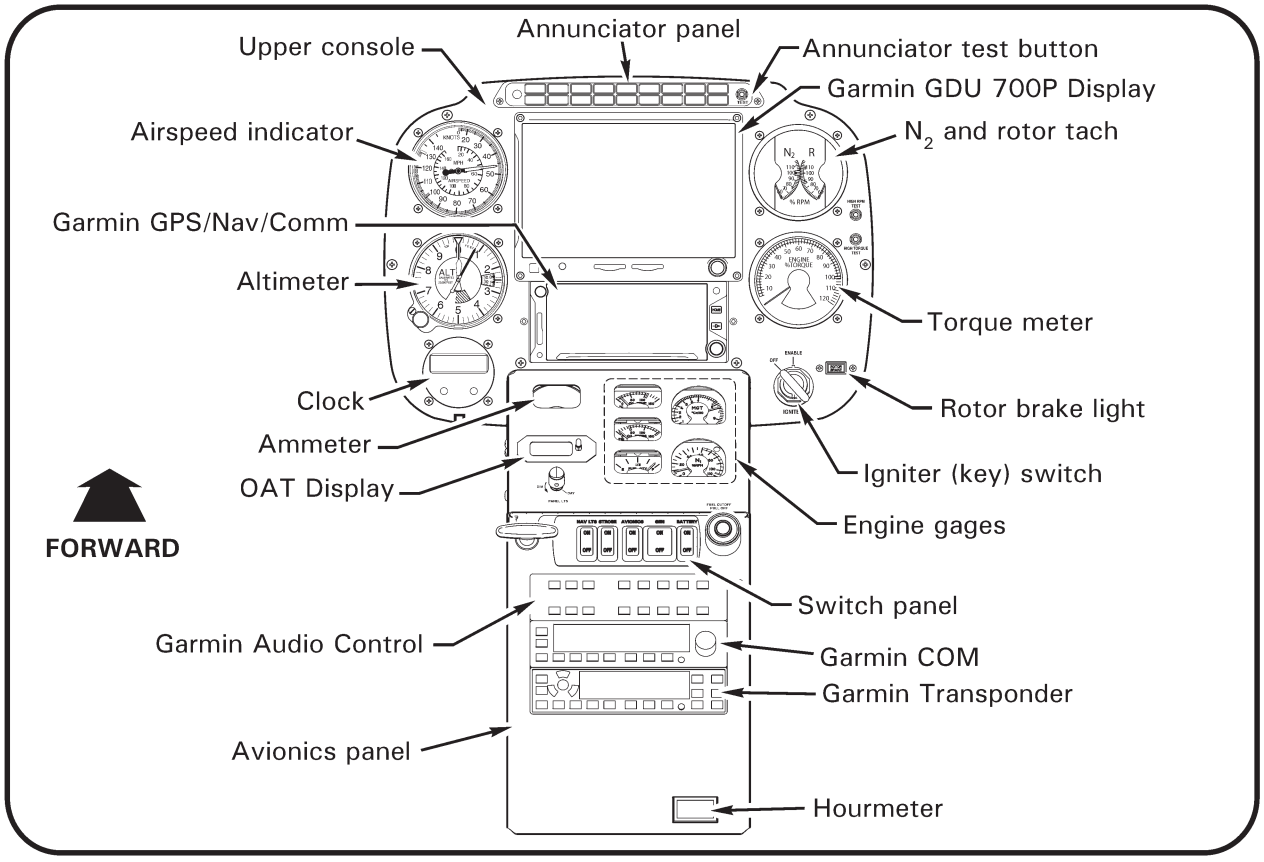


FIGURE 95-4 GARMIN G500H UPPER CONSOLE WITH GDU 700L

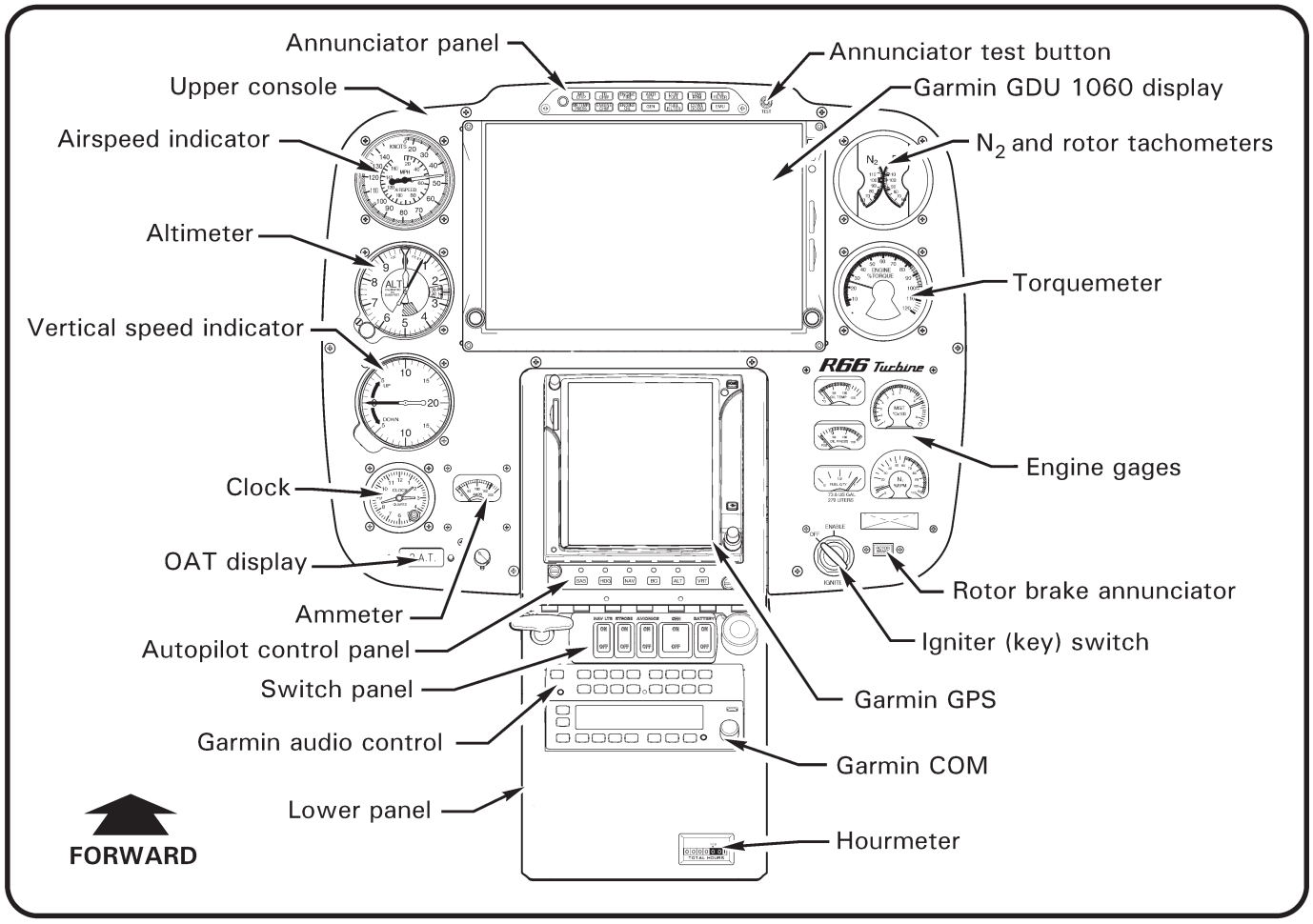


FIGURE 95-5 GARMIN G500H UPPER CONSOLE WITH GDU 1060

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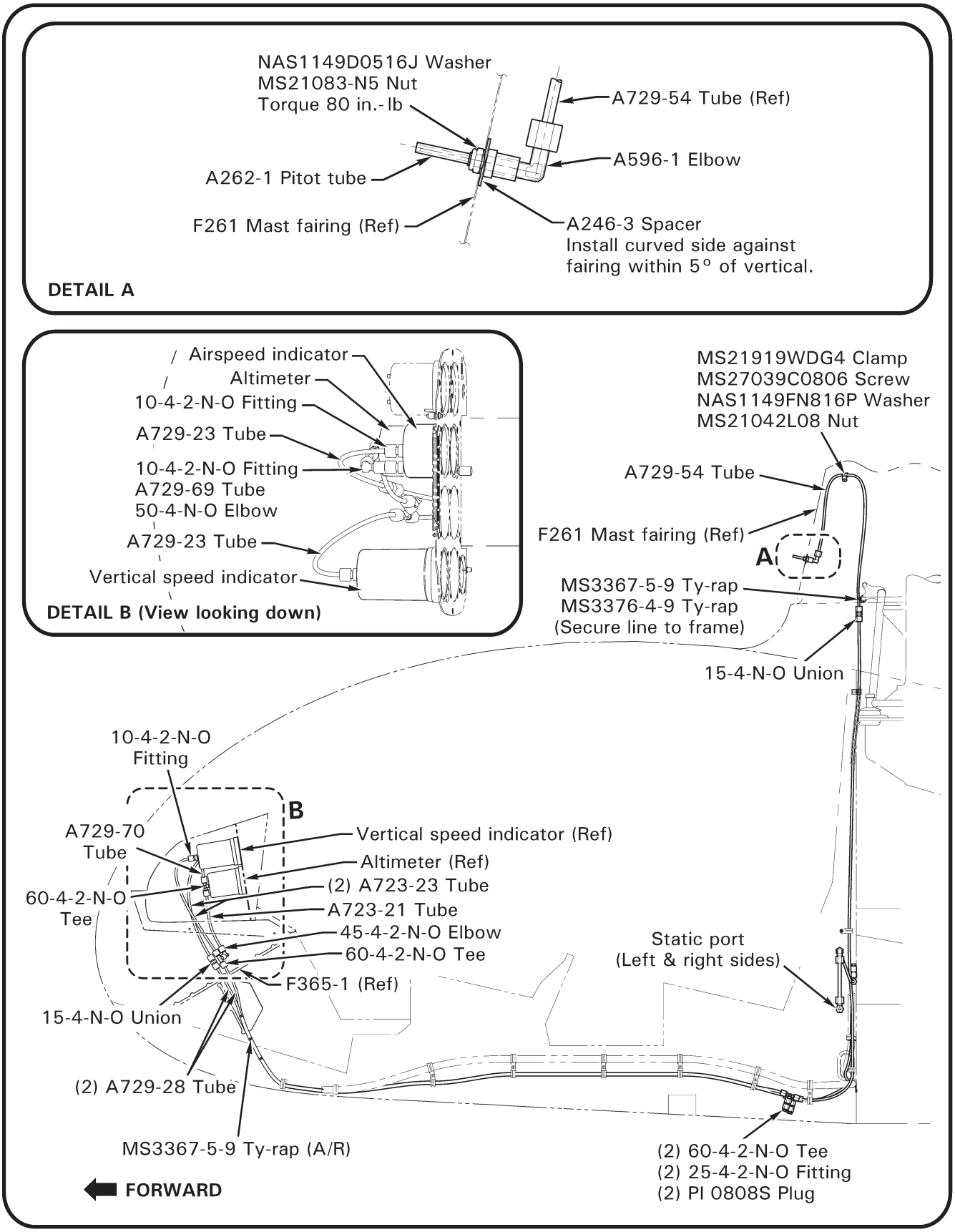


FIGURE 95-6 PITOT–STATIC SYSTEM INSTALLATION (STANDARD WITHOUT EFIS)

95-30 Pitot-Static System

A. Pitot System Leak Test

CAUTION

Do not apply suction to pitot system or pressure to static system.

1. Open mast fairing per § 53-22.
2. Refer to Figures 95-6 and 95-7. Seal drain hole in elbow aft of pitot tube with pressure sensitive tape. Connect a medical syringe, with plunger withdrawn, to pitot tube via flexible tubing.
3. SLOWLY apply pressure to pitot line by depressing syringe plunger until airspeed indicator reads 70 knots. Release force on plunger; plunger will remain in place without need to pinch flexible tubing.
4. Gently tap airspeed indicator glass to remove friction effects.
5. If airspeed indication drops more than 10 knots in one minute, an unacceptable leak is indicated. SLOWLY release pressure. Locate and repair any leak(s). Retest after any repairs.
6. Remove tape from pitot tube drain hole and verify airspeed indicator has returned to zero.
7. Remove test equipment.

B. Static System Leak Test

CAUTION

Airspeed indicator, altimeter, and vertical speed indicator may be damaged if suction to static line is applied or removed rapidly.

1. Refer to Figures 95-6 and 95-7. Set altimeter to location elevation.
2. Temporarily seal left or right side static opening with pressure sensitive tape. Cover remaining static port with a suction cup attached to a medical syringe.
3. SLOWLY apply suction to static port by withdrawing syringe plunger until altimeter indicates 500 feet greater than location elevation. Release force on plunger, wait one minute, and note any change in altimeter indication.
4. Change of less than 100 feet indication in one minute is acceptable. SLOWLY remove suction from static port. Locate and repair leak(s) if altimeter indication changes 100 or more feet in one minute. Retest after any repairs.
5. Remove test equipment.

95-30 Pitot-Static System (continued)

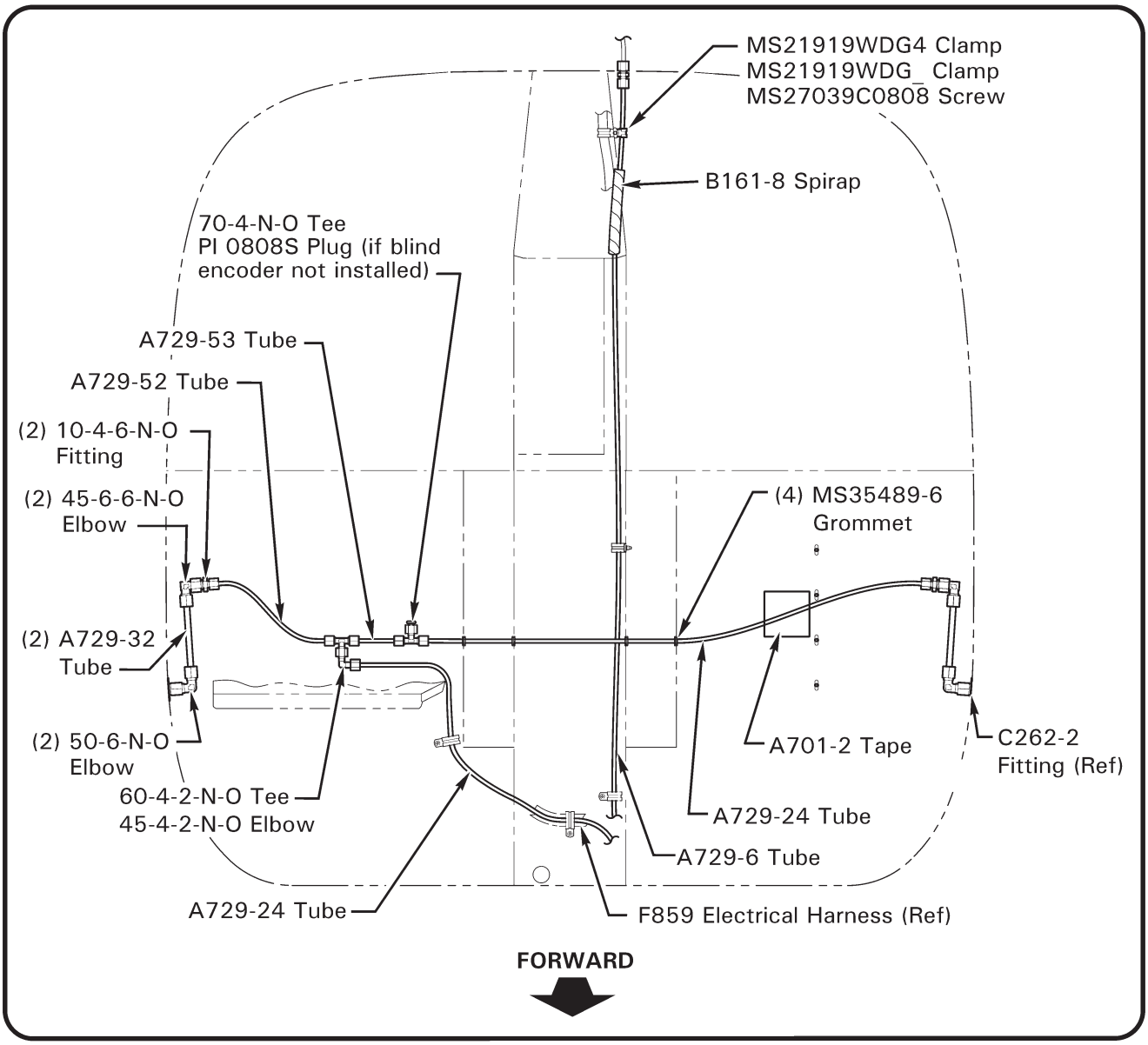


FIGURE 95-7 PITOT–STATIC SYSTEM INSTALLATION

95-30 Pitot-Static System (continued)

C. Schematics

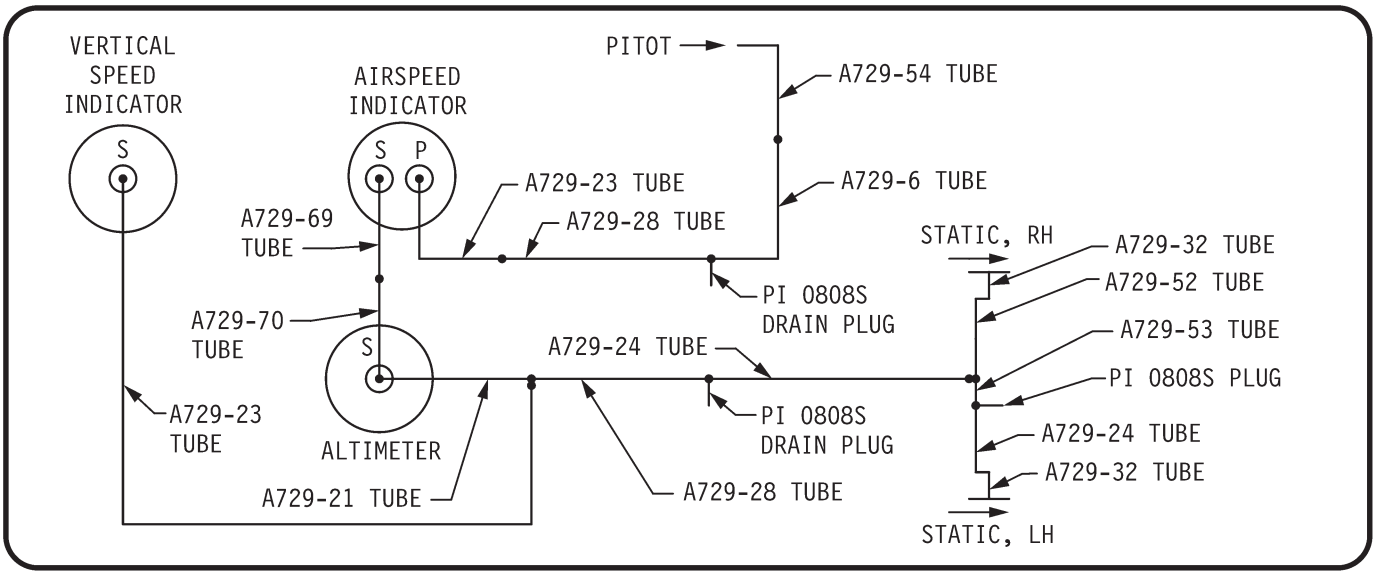


FIGURE 95-8 PITOT–STATIC SCHEMATIC — UPPER CONSOLE (STANDARD WITHOUT EFIS)

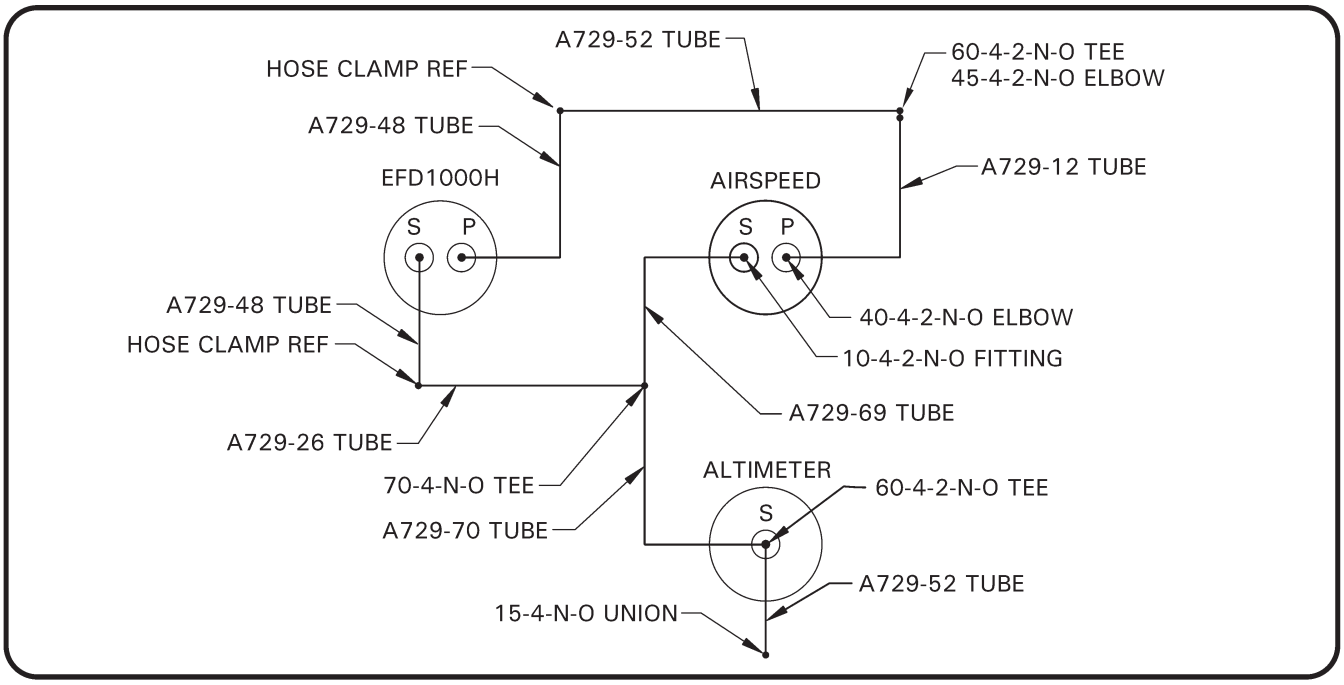


FIGURE 95-9 PITOT–STATIC SCHEMATIC — SIX-INSTRUMENT CONSOLE WITH ASPEN PFD

95-30 Pitot-Static System (continued)

C. Schematics (continued)

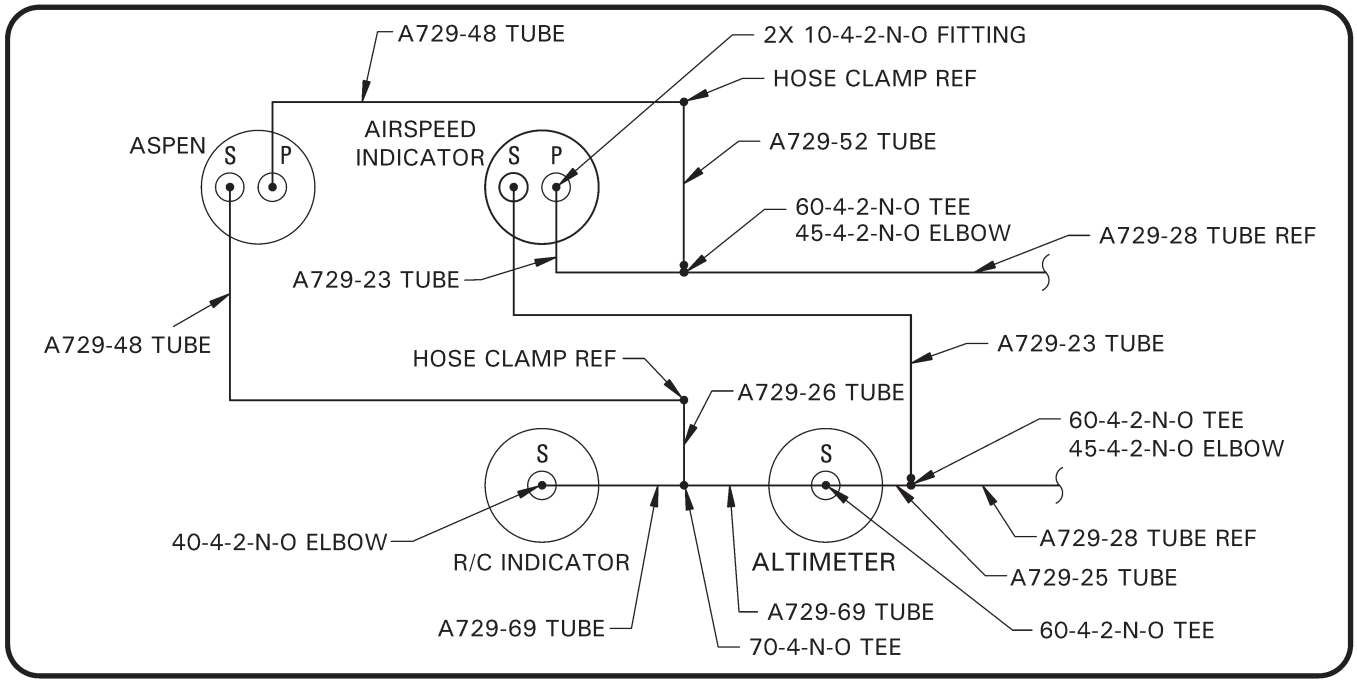


FIGURE 95-10 PITOT–STATIC SCHEMATIC — EIGHT-INSTRUMENT CONSOLE WITH ASPEN PFD

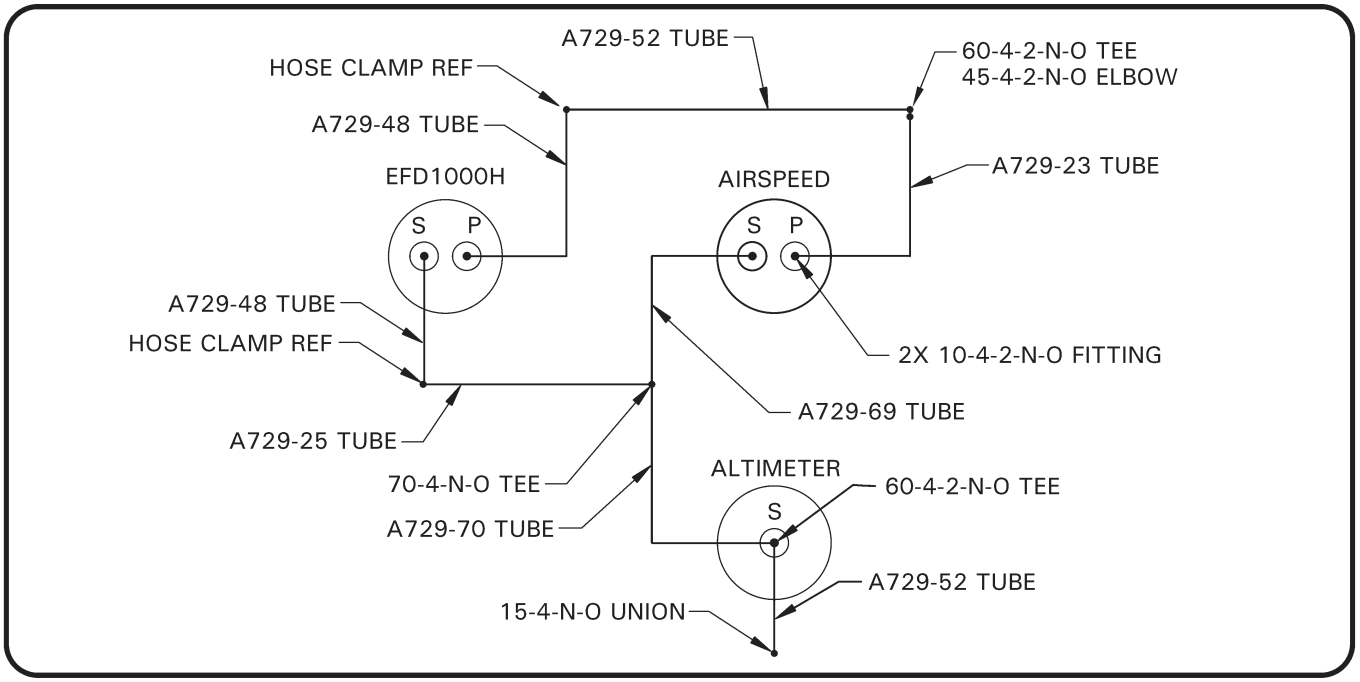


FIGURE 95-11 PITOT–STATIC SCHEMATIC — EIGHT-INSTRUMENT CONSOLE WITH ASPEN PFD AND MFD

95-30 Pitot-Static System (continued)

C. Schematics (continued)

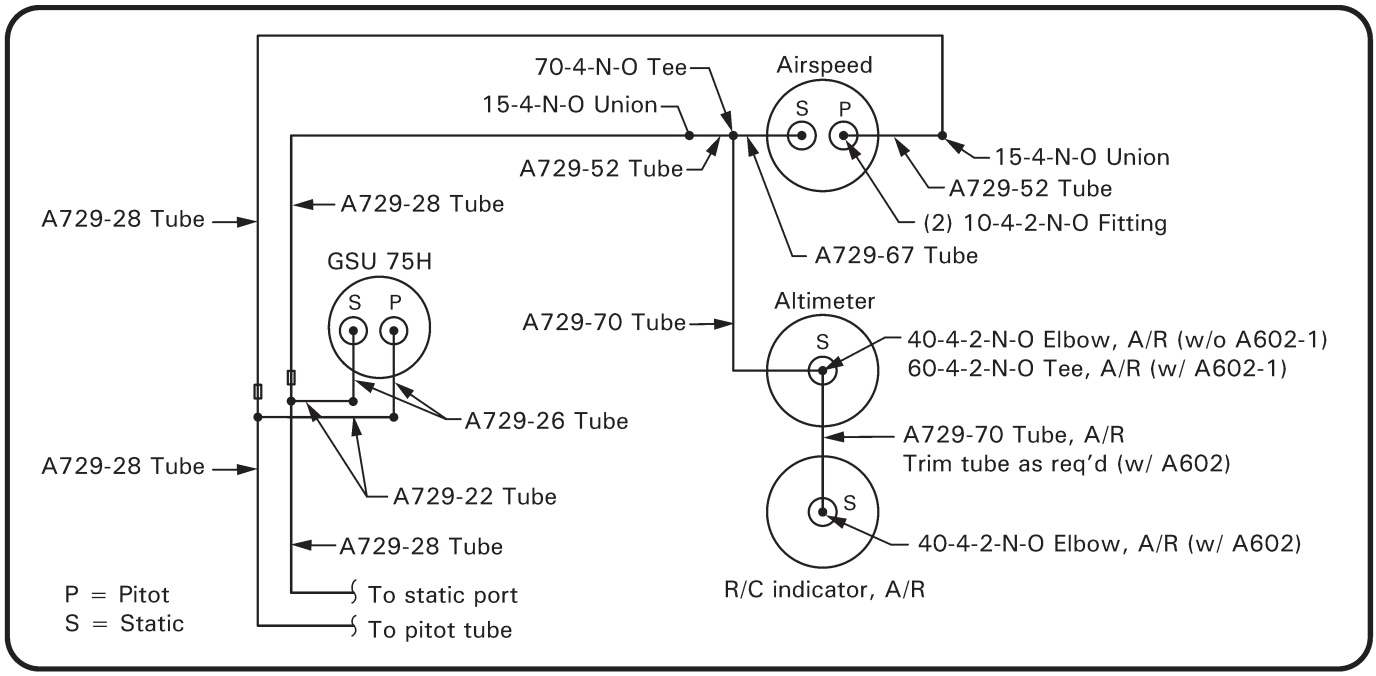


FIGURE 95-12 PITOT–STATIC SCHEMATIC — UPPER CONSOLE WITH GARMIN G500H EFIS

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95-40 Instruments, Engine Gauges, and Indicating Equipment

CAUTION

Protect instrumentation using foam padding or equivalent. Handle instruments like eggs.

NOTE

Refer to each instrument's section for instrument-specific instructions prior to removal or installation.

A. Instrument Removal

NOTE

If installed, Electronic Flight Displays (EFD) must be removed prior to removing console face assembly. If instrument is accessible thru EFD mounting location, face assembly removal is not necessary.

1. Turn battery and avionics switches off and pull out applicable circuit breaker(s).
2. If installed, remove EFD and/or other avionics per Chapter 97. For Police or ENG versions, also refer to Chapters 90 or 92, respectively.
3. Remove perimeter screws securing face to console and pull face aft as required.
4. While supporting instrument, remove screws securing instrument to face.
5. Disconnect wiring as applicable.
6. Disconnect pitot/static lines and cap or plug instrument and lines, as applicable. Temporarily secure face to console, if removed.
7. Remove instrument and place on foam padding.

B. Instrument Installation

1. Turn battery and avionics switches off and pull out applicable circuit breaker(s).
2. Remove caps and plugs and connect pitot/static lines, as applicable. Verify security.
3. Connect wiring as applicable. Verify security.
4. Position instrument in face and install screws securing instrument. Verify security.
5. Install perimeter screws securing face to console, if removed. Verify security.
6. Install EFD and/or avionics per Chapter 97, if removed. For Police or ENG versions, also refer to Chapters 90 or 92, respectively.
7. Perform pitot-static system checks as required per § 95-30.
8. Verify instrument(s) responds correctly to closing assigned circuit breaker and breaker remains closed.

95-41 Vertical Speed Indicator

A. Description

The vertical speed indicator indicates rate of ascent or descent. Check vertical speed indicator for a zero-rate needle indication when rotorcraft is in a stationary hover.

B. Schematic

Refer to § 95-30 Part C for pitot-static system schematics.

C. Removal

Remove vertical speed indicator per § 95-40 Part A.

D. Installation

Install vertical speed indicator per § 95-40 Part B.

E. Scheduled Maintenance and Inspections

Refer to § 5-45 100-Hour/Annual Inspection.

F. Special Maintenance and Inspections

1. If vertical speed indicator displays climb indication but does not return to zero in level flight, or if indication is erratic:
   a. Inspect static system for water or obstructions, and remove water or obstructions if found.
   b. Perform pitot-static system checks as required per § 95-30.
2. Perform appropriate function checks per § 5-40. If vertical speed indicator still displays erratic indication, or displays no indication, remove indicator per Part C, and return to RHC for inspection.
3. Install airworthy indicator per Part D.

95-42 Airspeed Indicator

A. Description

The airspeed indicator displays airspeed in knots and either miles or kilometers per hour. The airspeed indicator operates properly in forward flight only; backward or lateral flight will not indicate correct airspeed.

B. Schematic

Refer to § 95-30 Part C for pitot-static system schematics.

C. Removal

Remove airspeed indicator per § 95-40 Part A.

D. Installation

Install airspeed indicator per § 95-40 Part B.

E. Scheduled Maintenance and Inspections

Refer to § 5-45 100-Hour/Annual Inspection.

F. Special Maintenance and Inspections

1. If airspeed indicator displays no indication:
    a. Inspect pitot tube for obstructions and remove obstructions if found.
    b. Inspect pitot tube connection, and tighten connection if loose.
    c. Open upper console and inspect pitot line for kinks or bends.
    d. Perform pitot-static system checks as required per § 95-30.
    e. Perform appropriate function checks per § 5-40. If indicator still displays no indication, remove indicator per Part C, and return to RHC for inspection.
    f. Install airworthy indicator per Part D.
2. If airspeed indicator displays erratic indication:
    a. Inspect pitot-static system connection(s), and tighten connection(s) if loose.
    b. Inspect pitot-static system lines and verify no lines are cracked or broken.
    c. Inspect pitot-static system for water, and remove water if found.
    d. Open upper console and inspect pitot lines for kinks or bends.
    e. Perform pitot-static system checks as required per § 95-30.
    f. Perform appropriate function checks per § 5-40. If indicator still displays erratic indication, remove indicator per Part C, and return to RHC for inspection.
    g. Install airworthy indicator per Part D.

95-43 Engine (N_2) and Rotor Dual Tachometer

A. Description

CAUTION

Installation of electrical devices can affect accuracy and reliability of electronic tachometers.

An electronic engine (N2) and rotor dual tachometer is standard. Engine tachometer signal is provided by a transducer on the engine gearbox. Rotor tachometer signal is provided by magnets on the main gearbox tail rotor driveline yoke. Each tachometer is on a separate circuit with its own circuit breaker.

The tachometer bus receives power from the avionics bus or through the battery relay bypass circuit as long as the main rotor gearbox has oil pressure. Therefore, the tachometers will receive power through the bypass circuit whenever the rotors are turning even if the avionics bus is not powered. The bypass circuit is disconnected from the tachometer bus when the annunciator test button is depressed. Pressing the test button while the helicopter is running will confirm that the tachometers are receiving power from the avionics bus.

NOTE

Do not use magnetized tools.

CAUTION

Protect instrumentation using foam padding or equivalent. Handle instruments like eggs.

B. Removal

1. Turn battery switch off and pull out TACHS N_2 (2 amp) and R (2 amp) circuit breakers on circuit breaker panel.
2. Remove perimeter screws securing instrument face to console and pull face aft.
3. Remove screws securing console harness connector to F792-1 or -2 dual tachometer and unplug connector.
4. Supporting instrument, remove screws securing tachometer to face, and remove tachometer.

95-43 Engine (N_2) and Rotor Dual Tachometer (continued)

C. Installation

1. Turn battery switch off and pull out TACHS N_2 (2 amp) and R (2 amp) circuit breakers on circuit breaker panel.
2. Install screws securing F792-1 or -2 dual tachometer to instrument face. Verify security.
3. Plug in console harness connector to tachometer and install connector screws. Verify security.
4. Install perimeter screws securing face to console. Verify security.
5. Perform accuracy check and needle synchronization per Part D.

D. Accuracy Check and Needle Synchronization

CAUTION

Inadvertent engine overspeed can occur if accuracy check is not performed.

1. Perform PTG rigging check per § 76-22.
2. Install magnetic pickup (or photocell) portion of calibrated main rotor balancing equipment per § 18-11.
3. Push in TACHS N_2 (2 amp) and R (2 amp) circuit breakers on circuit breaker panel. Turn battery switch on, open throttle, and "beep" actuator to minimum (RPM) setting. Close throttle and turn battery switch off.
4. a. Start engine and run-up helicopter per R66 Pilot's Operating Handbook (POH) Section 4, establish stable idle, and record dual tachometer's % N_2 indication. Also record RPM displayed on balancer.

   b. Multiply dual tachometer's % N_2 indication (use 0.69 for 69%, 0.70 for 70%, etc.) by 408 RPM. Verify calculated RPM is within ± 8 RPM displayed on balancer.

   c. If calculated RPM is more than ± 8 RPM displayed on balancer, shut down helicopter per POH Section 4. Do not proceed further; contact RHC Technical Support.
5. Monitor RPM displayed on balancer and increase throttle to full open. Immediately close throttle and shut down helicopter per POH Section 4 if balancer indication exceeds 412 RPM.
6. Monitor RPM displayed on balancer and "beep" actuator until dual tachometer indicates 100% N_2. Verify RPM displayed on balancer is 408 ± 4 RPM; do not exceed 412 RPM.

95-43 Engine (N_2) and Rotor Dual Tachometer (continued)

D. Accuracy Check and Needle Synchronization (continued)

7. Verify dual tachometer's % NR indication is within 1% of % N_2 indication. If required, adjust % NR by turning screw on back of tachometer. Turning screw clockwise increases % NR and turning screw counterclockwise decrease % NR; one-half turn equals approximately 1% change. Adjusting screw is accessed by removing instrument face perimeter screws and pulling face aft.
8. Shut down helicopter per R66 POH Section 4.
9. Install perimeter screws securing face to console. Verify security.

E. Scheduled Maintenance and Inspections

Refer to § 5-45 100-Hour/Annual Inspection.

Refer to § 4-22 for recommended replacement time between overhauls.

F. Special Maintenance and Inspections

1. Perform accuracy check and needle synchronization per Part D.
2. If tachometer cannot be adjusted, remove tachometer per Part B, and return to RHC for inspection.
3. Install airworthy tachometer per Part C.

95-44 Altimeter

A. Description

The sensitive altimeter provides altitude information relative to mean sea level when the barometric pressure correction scale is properly set. Check altimeter calibration by setting correction scale to the current altimeter setting and checking the altimeter reading against field elevation; they must agree within 70 feet.

B. Schematic

Refer to § 95-30 Part C for pitot-static system schematics.

C. Removal

Remove altimeter per § 95-40 Part A.

D. Installation

Install altimeter per § 95-40 Part B.

E. Scheduled Maintenance and Inspections

Refer to § 5-45 100-Hour/Annual Inspection.

F. Special Maintenance and Inspections

1. If altimeter displays no indication:
    a. Inspect static lines for obstructions and remove obstructions if found.
    b. Perform pitot-static system checks as required per § 95-30.
    c. Perform appropriate function checks per § 5-40. If altimeter still displays no indication, remove altimeter per Part C, and return to RHC for inspection.
    d. Install airworthy altimeter per Part D.
2. If altimeter displays erratic indication:
    a. Inspect static system for water, and remove water if found.
    b. Perform pitot-static system checks as required per § 95-30.
    c. Perform appropriate function checks per § 5-40. If altimeter still displays erratic indication, remove altimeter per Part C, and return to RHC for inspection.
    d. Install airworthy altimeter per Part D.

95-45 Torquemeter

A. Description

The electronic torquemeter indicates percent torque. The torque sensor is an oil pressure transducer mounted on the front of the engine's accessory gearbox.

B. Schematic

Refer to Figures 98-1 thru 2B for applicable electrical schematic.

C. Removal

Remove torquemeter per § 95-40 Part A.

D. Installation

Install torquemeter per § 95-40 Part B.

E. Scheduled Maintenance and Inspections

Refer to § 5-45 100-Hour/Annual Inspection.

F. Special Maintenance and Inspections

1. Inspect wiring for loose, chafed, frayed, or broken wires. Verify no damaged connectors. Verify wiring neatness, proper routing and installation, and security.
2. Perform appropriate function checks per § 5-40. If accuracy of torquemeter is suspected, remove torquemeter per Part C, and check calibration per Figure 95-13.
3. Install airworthy torquemeter per Part D.

PIN	FUNCTION
1	SPARE
2	GND
3	CASE GND
4	SHIELD
5	SPARE
6	+POWER
7	+POWER
8	SIGNAL LO
9	SIGNAL HI

% TORQUE*	SIGNAL (VDC)*
0	0.480
20	0.914
40	1.347
60	1.781
80	2.214
83	2.279
100	2.648
120	3.081

* Accuracy is ± 0.5% at 20% and 100%; ± 2% elsewhere.

FIGURE 95-13 TORQUEMETER CALIBRATION CHECK

95-46 Magnetic Compass

A. Description

An internally illuminated, wet-type compass is attached to the center bow between the windshields above the instrument panel.

B. Schematic

Refer to Figures 98-1 thru 2B for applicable for electrical schematic.

C. Removal

1. Remove hardware securing B339-2 mount to windshield bow.
2. Remove hardware securing B148-5 compass assembly to mount.
3. Remove heat shrink as required and disconnect light bar wires from airframe harness. Remove compass.

D. Installation

1. Install heat shrinks over wires and connect B148-5 compass assembly's light bar wires to airframe harness. Verify security. Activate heat shrinks.
2. Install hardware securing compass to B339-2 mount. Verify security.
3. Install hardware securing mount to windshield bow. Verify security.
4. Using the airport compass rose, align the helicopter skids on the rose lines, and record the indicated compass headings at 30° increments. Adjust compass compensator magnets as required until the maximum error at any heading is 5° or less with all avionics operating, all exterior lights on, and dimmer full bright. Record the final readings on the aircraft compass card. Re-check 4 cardinal headings with lights off and all avionics off except COM radio 1 and transponder. Verify maximum error remains 5° or less.

E. Scheduled Maintenance and Inspections

Refer to § 5-45 100-Hour/Annual Inspection.

F. Special Maintenance and Inspections

1. Perform compass deviation check per Part D step 4.
2. If compass cannot be adjusted to limits specified, remove compass per Part C, and install airworthy compass per Part D.

95-47 N_1 Tachometer

A. Description

The electronic N_1 tachometer indicates percent RPM of the engine's gas producer section. The N_1 sensor is a sealed variable-reluctance, permanent-magnet device mounted atop the engine's accessory gearbox adjacent to the hoisting lug.

B. Schematic

Refer to Figures 98-1 thru 2B for applicable electrical schematic.

C. Removal

1. Turn battery switch off and pull out applicable circuit breaker(s).
2. Remove screws securing upper console to lower console and tilt upper console aft.
3. Loosen screws securing console wiring connector to G144-6 instrument cluster and disconnect wiring.
4. Remove screws securing instrument cluster to G051 shell assembly's face plate and remove instrument cluster.

D. Installation

1. Turn battery switch off and pull out applicable circuit breaker(s).
2. Remove screws securing upper console to lower console and tilt upper console aft.
3. Position G144-6 instrument cluster on G051 shell assembly's face plate and install screws. Verify security.
4. Connect console wiring connector to G144-6 instrument cluster tighten connector screws. Verify security.
5. Tilt console forward and install screws securing upper console to lower console. Verify security.
6. Perform appropriate function checks per § 5-40.

E. Scheduled Maintenance and Inspections

Refer to § 5-45 100-Hour/Annual Inspection.

95-47 N_1 Tachometer (continued)

F. Special Maintenance and Inspections

1. Inspect wiring for loose, chafed, frayed, or broken wires. Verify no damaged connectors. Verify wiring neatness, proper routing and installation, and security.
2. Perform appropriate function checks per § 5-40. If accuracy of engine gage is suspected, remove G144-6 instrument cluster per Part C, and return to RHC for inspection.
3. Install airworthy instrument cluster per Part D.

95-48 Measured Gas (Turbine) Temperature (MGT) Gage

A. Description

The measured gas temperature (MGT) gage connects to the engine's thermocouple harness via different size connectors to ensure correct polarity. Refer to RR300 Series Operation and Maintenance Manual (OMM) for periodic calibration requirements.

B. Schematic

Refer to Figures 98-1 thru 2B for applicable electrical schematic.

C. Removal

Remove G144-6 instrument cluster per § 95-47 Part C.

D. Installation

Install G144-6 instrument cluster per § 95-47 Part D.

E. Scheduled Maintenance and Inspections

Refer to § 5-45 100-Hour/Annual Inspection.

F. Special Maintenance and Inspections

Perform special maintenance and inspections per § 95-47 Part F.

95-49 Engine Oil Pressure Gage

A. Description

The engine oil pressure gage is electronic. The oil pressure sensor is a transducer mounted on the lower front of the engine's accessory gearbox.

B. Schematic

Refer to Figures 98-1 thru 2B for applicable electrical schematic.

C. Removal

Remove G144-6 instrument cluster per § 95-47 Part C.

D. Installation

Install G144-6 instrument cluster per § 95-47 Part D.

E. Scheduled Maintenance and Inspections

Refer to § 5-45 100-Hour/Annual Inspection.

F. Special Maintenance and Inspections

Perform special maintenance and inspections per § 95-47 Part F.

95-50 Engine Oil Temperature Gage

A. Description

The engine oil temperature gage is electronic. The oil temperature sensor is a transducer mounted on the inboard wall of the oil tank.

B. Schematic

Refer to Figures 98-1 thru 2B for applicable electrical schematic.

C. Removal

Remove G144-6 instrument cluster per § 95-47 Part C.

D. Installation

Install G144-6 instrument cluster per § 95-47 Part D.

E. Scheduled Maintenance and Inspections

Refer to § 5-45 100-Hour/Annual Inspection.

F. Special Maintenance and Inspections

Perform special maintenance and inspections per § 95-47 Part F.

95-51 Fuel Quantity Gage

A. Description

The electric fuel quantity gage indicates relative fuel quantity. The variable resistance sender is mounted near the fuel cap.

B. Schematic

Refer to Figures 98-1 thru 2B for applicable electrical schematic.

C. Removal

Remove G144-6 instrument cluster per § 95-47 Part C.

D. Installation

Install G144-6 instrument cluster per § 95-47 Part D.

E. Scheduled Maintenance and Inspections

Refer to § 5-45 100-Hour/Annual Inspection.

F. Special Maintenance and Inspections

Perform special maintenance and inspections per § 95-47 Part F.

95-52 Clock

A. Description

A manually set electric analog clock is standard equipment; a digital clock is optional.

B. Schematic

Refer to Figure 98-1 thru 2B for applicable electrical schematic.

C. Removal

1. Remove perimeter screws securing face to console and pull face aft, or remove screws securing upper console to lower console and tilt upper console aft, as applicable.
2. Remove screws securing clock to face.
3. Disconnect console wiring from clock wiring at connectors, and remove clock.

D. Installation

1. Connect console wiring to clock wiring at connectors. Verify security.
2. Install screws securing clock to face. Verify security.
3. Install perimeter screws securing face to console and verify security, or tilt console forward and install screws securing upper console to lower console and verify security, as required.

E. Scheduled Maintenance and Inspections

Refer to § 5-45 100-Hour/Annual Inspection.

F. Special Maintenance and Inspections

1. Check AGC-3 (3 amp) fuse at firewall for evidence of melting and replace fuse as required.
2. Inspect wiring for loose, chafed, frayed, or broken wires. Verify no damaged connectors. Verify wiring neatness, proper routing and installation, and security.
3. If clock is still inoperative, remove clock per Part C, and install airworthy clock per Part D.

95-53 Ammeter

A. Description

The ammeter indicates electrical system loads. System load is measured across the A780-71 cable (shunt; cable is calibrated, do not alter cable) located between the starter/generator and relay on right side of engine compartment.

B. Schematic

Refer to Figure 98-1 thru 2B for applicable electrical schematic.

C. Removal

1. Remove perimeter screws securing face to console and pull face aft, or remove screws securing upper console to lower console and tilt upper console aft, as applicable.
2. Remove screws securing ammeter to face.
3. Disconnect console wiring from ammeter wiring at connectors, and remove ammeter.

D. Installation

1. Connect console wiring to ammeter wiring at connectors. Verify security.
2. Install screws securing ammeter to face. Verify security.
3. Install perimeter screws securing face to console and verify security, or tilt console forward and install screws securing upper console to lower console and verify security, as required.

E. Scheduled Maintenance and Inspections

Refer to § 5-45 100-Hour/Annual Inspection.

F. Special Maintenance and Inspections

1. Check continuity across two 3-amp fuses in B304-16 fuse assembly (in airframe harness on right side of engine compartment) and replace fuse assembly as required.
2. Inspect wiring for loose, chafed, frayed, or broken wires. Verify no damaged connectors. Verify wiring neatness, proper routing and installation, and security.
3. If ammeter is still inoperative, remove ammeter per Part C, and install airworthy ammeter per Part D.

95-54 Outside Air Temperature (OAT) Gage/Voltmeter

A. Description

NOTE
No cutting or splicing of OAT probe wires is permitted.

The outside air temperature gage is connected via a calibrated, twisted pair wiring harness to a stainless steel probe protruding from the chin.

B. Schematic

Refer to Figures 98-1 thru 2B for applicable electrical schematic.

C. Removal

1. Remove perimeter screws securing face to console and pull face aft, or remove screws securing upper console to lower console and tilt upper console aft, as applicable.
2. Remove screws securing OAT gage to face.
3. Disconnect console wiring from OAT gage wiring at connectors, and remove gage.

D. Installation

1. Connect console wiring to OAT gage wiring at connectors. Verify security.
2. Install screws securing OAT gage to face. Verify security.
3. Install perimeter screws securing face to console and verify security, or tilt console forward and install screws securing upper console to lower console and verify security, as required.

E. Scheduled Maintenance and Inspections

Refer to § 5-45 100-Hour/Annual Inspection.

F. Special Maintenance and Inspections

1. Inspect wiring for loose, chafed, frayed, or broken wires. Verify no damaged connectors. Verify wiring neatness, proper routing and installation, and security.
2. If OAT gage is still inoperative, remove OAT gage per Part C, and install airworthy OAT gage per Part D.

95-55 Hourmeters

A. Description

Two hourmeters are standard. One hourmeter is mounted above the ammeter and is activated by main gearbox oil pressure. Another hourmeter on the horizontal panel outboard of the pilot's seat is activated by a combination of main gearbox oil pressure and a raised collective and is approved for recording time in service.

B. Schematic

Refer to Figures 98-1 thru 2B for applicable electrical schematic.

C. Removal

Collective-Activated Hourmeter

1. Remove screws securing hourmeter, faceplate, and carpet to F353-2 panel.
2. Disconnect airframe wiring from hourmeter wiring at connectors, and remove hourmeter.

Console Hourmeter

1. Remove screws securing hourmeter to F640 face assembly, remove screws securing face to lower console, and supporting hourmeter, remove face.
2. Disconnect airframe wiring from hourmeter, and remove hourmeter.

D. Installation

Collective-Activated Hourmeter

1. Connect airframe wiring to hourmeter wiring at connectors. Verify security.
2. Install screws securing hourmeter, faceplate, and carpet to F353-2 panel. Verify security.

Console Hourmeter

1. Connect airframe wiring to hourmeter (F859-2053 to positive terminal). Verify security.
2. Install screws securing F640 face assembly to lower console. Install screws securing hourmeter to face. Verify security.

E. Scheduled Maintenance and Inspections

On condition.

F. Special Maintenance and Inspections

1. Inspect wiring for loose, chafed, frayed, or broken wires. Verify no damaged connectors. Verify wiring neatness, proper routing and installation, and security.
2. If hourmeter is still inoperative, remove hourmeter per Part C, and install airworthy hourmeter per Part D. Make appropriate maintenance record entries.

95-60 Electronic Flight Displays

95-61 Garmin Display Unit (GDU) 700L TXi or 1060 TXi

Refer to §§ 97-76 or 97-77 for Garmin display unit information.

95-62 Garmin Display Unit (GDU) 620 Installation

Refer to § 97-75 for Garmin display unit information.

95-63 Aspen EFD500H & EFD1000H Display(s) Installation

Refer to § 97-61 for Aspen system information.

CHAPTER 97

AVIONICS

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CHAPTER 97

AVIONICS

97-00 Description

This chapter contains maintenance information for avionics equipment installed in the helicopter. These systems include communication and audio equipment, transponders and ADS-B equipment, navigation and GPS equipment, weather and datalink equipment, radar altimeter equipment, electronic flight instrument systems, and avionics data sources and interfaces.

The information in this chapter is intended for equipment installed at the factory or installed using approved RHC Kit instructions. Avionics equipment installed under a Supplemental Type Certificate or other approval not provided by RHC must be maintained in accordance with the Instructions for Continued Airworthiness supplied by the approval holder, except where those instructions specifically refer to this manual.

Avionics equipment varies by aircraft; refer to the applicable section for installed avionics.

97-10 Communication and Audio Systems

97-11 Garmin GTR 225B COM Radio

NOTE

Refer to Garmin GTR 225B Maintenance Manual and Instructions for Continued Airworthiness.

A. Description

The Garmin GTR 225B includes an airport frequency database, the ability to monitor the standby frequency, and user memory channels. This COM radio is a dual voltage unit, suitable for use in 14V and 28V systems.

B. Schematic

Refer to Figure 98-20A or B for applicable Garmin GTR 225B COM Radio Installation electrical schematic.

C. Removal

1. Turn battery switch off and pull out applicable COM radio (5 amp) circuit breaker on circuit breaker panel.
2. Loosen radio key securing GTR 225B COM radio to avionics tray.
3. Carefully unplug and remove radio from tray.

97-11 Garmin GTR 225B COM Radio (continued)

D. Installation

1. Turn battery switch off and pull out applicable COM radio (5 amp) circuit breaker on circuit breaker panel.
2. Carefully plug in and install GTR 225B COM radio in appropriate location in avionics tray.
3. Tighten radio key securing radio to tray. Verify equipment security.
4. Push in applicable COM radio (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GTR 225B Pilot's Guide. Turn battery & avionics switches off.

E. Antenna

Refer to § 6-80 for antenna locations and R66 Illustrated Parts Catalog (IPC) Chapter 6.

NOTE
Antenna installation depends on number of COM installations and additional equipment installed.

Removal

1. Turn battery switch off and pull out applicable COM radio (5 amp) circuit breaker on circuit breaker panel.
2. Using plastic scraper, remove B270-1 sealant from around COM antenna at corners where it attaches to tailcone.
3. Disconnect antenna cable from antenna. As required, remove B270-13 sealant from fastener holes. Remove screws securing antenna to tailcone & remove antenna.

Installation

1. Turn battery switch off and pull out applicable COM radio (5 amp) circuit breaker on circuit breaker panel.
2. Remove paint & primer from antenna mating surfaces to ensure electrical ground.
3. As required, apply light coat B270-13 sealant to screw threads and install screws securing antenna to tailcone. As required, seal around screw heads and fill fastener holes using B270-13 sealant and allow to dry. Verify security.
4. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to tailcone and allow to dry.
5. Connect antenna cable to antenna. Verify security.
6. Perform ground checks per Part D steps 4 and 5.

97-11 Garmin GTR 225B COM Radio (continued)

F. Scheduled Maintenance and Inspections

NOTE

All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (built-in test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 97-80 for avionics software information.

G. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel and upper console.
2. Inspect condition of and verify no obvious damage to COM radio, radio tray, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel and upper console. Perform ground checks per Part D steps 4 and 5.

97-12 Garmin GTR 205 COM Radio

> NOTE
>
> Refer to Garmin GTR 205x/GTR 205xR Installation Manual for functional-check information.

A. Description

The GTR 205 is a COM radio transceiver that has a high-resolution LCD display with 10W COM transmit power. Software enablement cards are available to allow for NVIS and 16W COM transmit power. The COM radio has pilot-controlled options of 8.33 kHz or 25 kHz channel spacing. Built-in Bluetooth® allows pairing up to eight Bluetooth-enabled devices. Only one active device connection is permitted at a time.

B. Schematic

Refer to Figure 98-20 for GTR 205 COM Radio Installation electrical schematic.

C. Removal

1. Turn battery switch off and pull out applicable COM radio (5 amp) circuit breaker on circuit breaker panel.
2. Using a 3/32-inch hex-drive tool, loosen radio key locking GTR 205 COM radio to avionics tray.
3. Carefully unplug/remove COM radio from avionics tray.

D. Installation

1. Turn battery switch off and pull out applicable COM radio (5 amp) circuit breaker on circuit breaker panel.
2. Carefully plug in and install GTR 205 COM radio in appropriate location in avionics tray.
3. Using a 3/32-inch hex-drive tool, tighten radio key to lock GTR 205 COM radio to avionics tray.
4. Push in applicable COM radio (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GTR 205x/GTR 205xR Installation Manual. Turn battery & avionics switches off.

97-12 Garmin GTR 205 COM Radio (continued)

E. Antenna

Refer to § 6-80 for antenna locations and R66 Illustrated Parts Catalog (IPC) Chapter 6.

NOTE
Antenna installation depends on number of COM installations and additional equipment installed.

Removal

1. Turn battery switch off and pull out applicable COM radio (5 amp) circuit breaker on circuit breaker panel.
2. Using plastic scraper, remove B270-1 sealant from around COM antenna at corners where it attaches to tailcone.
3. Disconnect antenna cable from antenna. As required, remove B270-13 sealant from fastener holes. Remove screws securing antenna to tailcone & remove antenna.

Installation

1. Turn battery switch off and pull out applicable COM radio (5 amp) circuit breaker on circuit breaker panel.
2. Remove paint & primer from antenna mating surfaces to ensure electrical ground.
3. As required, apply light coat B270-13 sealant to screw threads and install screws securing antenna to tailcone. As required, seal around screw heads and fill fastener holes using B270-13 sealant and allow to dry. Verify security.
4. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to tailcone and allow to dry.
5. Connect antenna cable to antenna. Verify security.
6. Push in applicable COM radio (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
7. Change frequency to local ATIS and confirm COM is receiving. Turn battery & avionics switches off.

97-12 Garmin GTR 205 COM Radio (continued)

F. Scheduled Maintenance and Inspections

NOTE
All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (built-in test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE
Refer to § 97-80 for avionics software information.

G. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel and upper console.
2. Inspect condition of and verify no obvious damage to COM radio, avionics tray, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Close and secure circuit breaker panel and upper console. Turn battery & avionics switches on.
4. Change frequency to local ATIS and confirm COM is receiving. Turn battery & avionics switches off.

97-13 Garmin GMA 350H and 350Hc Audio Panel

A. Description

The GMA 350H and 350Hc audio panels provide five-place intercom functionality and audio switching between each connected COM radio, and switching auxiliary input via jack or Bluetooth® (GMA 350Hc only).

B. Schematic

Refer to Figures 98-24, 98-25A, and 98-25B for applicable Audio Panel Installation electrical schematics.

C. Removal

1. Turn battery switch off and pull out AUDIO PANEL (5 amp) circuit breaker on circuit breaker panel.
2. Using a 3/32-inch hex-drive tool, loosen radio key locking GMA audio panel to avionics tray. Carefully remove and unplug GMA audio panel.

D. Installation

1. Turn battery switch off and pull out AUDIO PANEL (5 amp) circuit breaker on circuit breaker panel.
2. Carefully plug in and install GMA audio panel in appropriate location in avionics tray.
3. Using a 3/32-inch hex-drive tool, tighten radio key to lock GMA audio panel to avionics tray.
4. Push in AUDIO PANEL (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate checks per Garmin GMA 350, GMA 350H, GMA 350Hc, GMA 350c Installation Manual.

97-20 Transponders and ADS-B Systems

Automatic Dependent Surveillance-Broadcast (ADS-B) "Out" equipment transmits aircraft-specific data and GPS-derived position information to air traffic control. ADS-B "In" equipment receives data from other aircraft and/or from air traffic control. ADS-B In equipment is not required for R66 operation in the United States. The R66 may be equipped with ADS-B Out, or with ADS-B Out & ADS-B In systems.

ADS-B equipment is programmed with aircraft-specific data at installation. ADS-B systems use the primary installed GPS for position information. Additional flight-specific data are entered by the pilot using transponder controls. ADS-B Out equipment installed at the factory operates on frequency 1090 MHz.

The ADS-B In system receives data on frequencies 978 MHz and 1090 MHz. Received data are displayed on the primary GPS screen.

ADS-B Out system faults are annunciated on the transponder and primary GPS screens. ADS-B In system faults are annunciated on the primary GPS screen.

Change of aircraft registration may require ADS-B equipment programming by qualified maintenance personnel.

ADS-B is part of the NextGen airspace-modernization initiative, which also includes FIS-B and TIS-B. Some ADS-B equipment, such as the Garmin GTX 345R transponder and GDL 88 datalink, can receive weather, TFRs, NOTAMs, and other FAA notices over FIS-B on 978 MHz for display on a Garmin GTN navigator. TIS-B is a ground-based system that augments ADS-B by converting radar-acquired aircraft coordinates and transponder information into ADS-B broadcasts, providing ADS-B visibility of aircraft that lack ADS-B Out.

Refer to R66 Pilot's Operating Handbook Section 7 for additional information.

97-21 Garmin GTX 33 Transponder

> NOTE
>
> Refer to Garmin GTX 33 Transponder Maintenance Manual and Instructions for Continued Airworthiness.

A. Description

The Garmin GTX 33 is a remote-mounted transponder with extended-squitter ADS-B broadcast capability. The GTX 33 has no control panel face; it is controlled via the Garmin GTN 6XX/7XX-series GPS navigator.

B. Schematic

Refer to Figure 98-16 for Garmin GTX 33 Transponder Installation electrical schematic.

C. Removal

1. Turn battery & avionics switches off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Remove hardware securing F640 face assembly to avionics panel and remove face.
3. Loosen screw and swing handle across GTX 33 transponder to unlock. Carefully unplug/remove transponder from tray.

D. Installation

1. Turn battery & avionics switches off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Carefully plug-in/install GTX 33 transponder in appropriate location in avionics tray.
3. Swing handle across transponder to lock and tighten screw. Verify equipment security.
4. Install hardware securing F640 face assembly to avionics panel.
5. Push in XPDR (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
6. Perform appropriate functional checks per Garmin GTX 33 Transponder Maintenance Manual and Instructions for Continued Airworthiness. Turn battery & avionics switches off.

97-21 Garmin GTX 33 Transponder (continued)

E. Antenna

Refer to § 6-80 for antenna locations and R66 Illustrated Parts Catalog (IPC) Chapter 6.

NOTE

Antenna installation depends on optional equipment installed.

Removal

1. Turn battery & avionics switches off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Remove (4) screws securing B322-11 plate & antenna to cabin skin. Pull plate & antenna down to disconnect antenna cable and remove from helicopter.
3. If desired, use a plastic scraper to remove B270-1 sealant from around antenna at corners where it attaches to B322-11 plate. Remove hardware securing antenna to plate and remove antenna.

Installation

1. Turn battery & avionics switches off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Remove paint & primer from between cabin skin and B322 plate/doubler to ensure electrical ground.
3. If not previously accomplished, install hardware securing transponder antenna to plate/doubler. Verify security. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to plate/doubler and allow to dry.
4. Connect antenna cable to antenna and install screws securing plate & antenna to cabin skin. Verify security.
5. Perform ground checks per Part D steps 4 and 5.

F. Scheduled Maintenance and Inspections

NOTE

All factory-installed Garmin units are “on condition” and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 97-80 for avionics software information.

97-21 Garmin GTX 33 Transponder (continued)

G. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel.
2. Remove GTX 33 transponder per Part C. Inspect condition of and verify no obvious damage to transponder, radio tray, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing.
3. Secure circuit breaker panel. Install transponder per Part D.

97-22 Garmin GTX 330 ES Transponder

NOTE

Refer to Garmin GTX 330 ES Transponder Maintenance Manual and Instructions for Continued Airworthiness.

A. Description

The Garmin GTX 330 ES is a panel-mounted Mode S digital transponder with traffic datalink capability and dedicated pushbuttons for squawk-code selection.

B. Schematic

Refer to Figure 98-16 for Garmin GTX 330 ES transponder & blind encoder electrical schematic.

C. Removal

1. Turn battery switch off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Loosen radio key securing GTX 330 ES transponder to avionics tray.
3. Carefully unplug/remove transponder from tray.

D. Installation

1. Turn battery switch off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Carefully plug-in/install GTX 330 ES transponder in appropriate location in avionics tray.
3. Tighten radio key securing transponder to tray. Verify equipment security.
4. Push in XPDR (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GTX 330 ES Pilot's Guide. Turn battery & avionics switches off.

E. Antenna

Refer to § 6-80 for antenna locations and R66 Illustrated Parts Catalog (IPC) Chapter 6.

NOTE

Antenna installation depends on optional equipment installed.

97-22 Garmin GTX 330 ES Transponder (continued)

E. Antenna (continued)

Removal

1. Turn battery & avionics switches off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Remove (4) screws securing B322-11 plate & antenna to cabin skin. Pull plate & antenna down to disconnect antenna cable and remove from helicopter.
3. If desired, use a plastic scraper to remove B270-1 sealant from around antenna at corners where it attaches to B322-11 plate. Remove hardware securing antenna to plate and remove antenna.

Installation

1. Turn battery & avionics switches off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Remove paint & primer from between cabin skin and B322-11 plate to ensure electrical ground.
3. If not previously accomplished, install hardware securing transponder antenna to plate. Verify security. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to plate and allow to dry.
4. Connect antenna cable to antenna and install screws securing plate & antenna to cabin skin. Verify security.
5. Perform ground checks per Part D steps 4 and 5.

F. Scheduled Maintenance and Inspections

NOTE

All factory-installed Garmin units are “on condition” and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 97-80 for avionics software information.

G. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel and upper console.
2. Inspect condition of and verify no obvious damage to transponder, radio tray, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel and upper console. Perform ground checks per Part D steps 4 and 5.

97-23 Garmin GTX 335 and 345 Transponders

> NOTE
>
> Refer to Garmin GTX 3X5 Maintenance Manual and Instructions for Continued Airworthiness.

A. Description

The Garmin GTX 335 and GTX 345 (GTX 3X5) are Mode S Extended Squitter (ES) transponders that satisfy ADS-B "Out" requirements. The primary difference is that the GTX 335 is an ADS-B Out-only unit, while the GTX 345 includes both ADS-B In (traffic and weather) and wireless Bluetooth® connectivity.

Refer to R66 Pilot's Operating Handbook Section 7 for additional information.

B. Schematic

Refer to Figure 98-15A or 95-15B for applicable GTX 3X5 transponder & blind-encoder electrical schematic.

C. Removal

1. Turn battery switch off and pull out XPDR (3 amp) circuit breaker on circuit breaker panel.
2. Loosen radio key securing GTX 3X5 transponder to avionics tray.
3. Carefully unplug/remove transponder from tray.

D. Installation

1. Turn battery switch off and pull out XPDR (3 amp) circuit breaker on circuit breaker panel.
2. Carefully plug-in/install GTX 3X5 transponder in appropriate location in avionics tray.
3. Tighten radio key securing transponder to tray. Verify equipment security.
4. Push in XPDR (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GTX 3X5 Maintenance Manual. Turn battery & avionics switches off.

E. Antenna

Refer to § 6-80 for antenna locations and R66 Illustrated Parts Catalog (IPC) Chapter 6.

> NOTE
>
> Antenna installation depends on optional equipment installed.

97-23 Garmin GTX 335 and 345 Transponders (continued)

E. Antenna (continued)

Removal

1. Turn battery & avionics switches off and pull out XPDR (3 amp) circuit breaker on circuit breaker panel.
2. Remove (4) screws securing B322-11 plate & antenna to cabin skin. Pull plate & antenna down to disconnect antenna cable and remove from helicopter.
3. If desired, use a plastic scraper to remove B270-1 sealant from around antenna at corners where it attaches to B322-11 plate. Remove hardware securing antenna to plate and remove antenna.

Installation

1. Turn battery & avionics switches off and pull out XPDR (3 amp) circuit breaker on circuit breaker panel.
2. Remove paint & primer from between cabin skin and B322-11 plate to ensure electrical ground.
3. If not previously accomplished, install hardware securing transponder antenna to plate. Verify security. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to plate and allow to dry.
4. Connect antenna cable to antenna and install screws securing plate & antenna to cabin skin. Verify security.
5. Perform ground checks per Part D steps 4 and 5.

F. Scheduled Maintenance and Inspections

NOTE

All factory-installed Garmin units are “on condition” and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 97-80 for avionics software information.

G. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel and upper console.
2. Inspect condition of and verify no obvious damage to transponder, radio tray, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel and upper console. Perform ground checks per Part D steps 4 and 5.

97-24 Garmin GTX 345R Transponder

> NOTE
>
> Refer to Garmin GTX 345R Transponder Maintenance Manual and Instructions for Continued Airworthiness.

A. Description

The Garmin GTX 345R is a remote-mounted transponder with extended-squitter ADS-B broadcast capability. The GTX 345R has no control-panel face; it is controlled via the Garmin GTN 6XX/7XX-series GPS navigator.

B. Schematic

Refer to Figure 98-15 for Garmin GTX 345R Transponder Installation electrical schematic.

C. Removal

1. Turn battery & avionics switches off, and pull out XPDR (3 amp) circuit breaker on circuit breaker panel.
2. Hinge front left seat forward.
3. As required, remove hardware securing F748-1 cover under front left seat and remove cover.
4. Loosen screws securing backplate to transponder and disconnect backplate with attached wiring.
5. Loosen retention collar at inboard side of GTX 345R to release, then slide inboard and up to remove from helicopter.

D. Installation

1. Turn battery & avionics switches off, and pull out XPDR (3 amp) circuit breaker on circuit breaker panel.
2. Insert outboard end of transponder mounting bracket into bracket secured to underseat compartment. Position locking mechanism and tighten retention collar.
3. Connect backplate to transponder and install screws securing backplate.
4. As required, position F748-1 cover under copilot's seat and secure with hardware.
5. Hinge front left seat back.
6. Push in XPDR (3 amp) circuit breaker on circuit breaker panel, and turn battery & avionics switches on.
7. Perform appropriate functional checks per Garmin GTX 345R Transponder Maintenance Manual and Instructions for Continued Airworthiness. Turn battery & avionics switches off.

97-24 Garmin GTX 345R Transponder (continued)

E. Antenna (continued)

Removal

1. Turn battery & avionics switches off and pull out XPDR (3 amp) circuit breaker on circuit breaker panel.
2. Remove (4) screws securing B322-11 plate & antenna to cabin skin. Pull plate & antenna down to disconnect antenna cable and remove from helicopter.
3. If desired, use a plastic scraper to remove B270-1 sealant from around antenna at corners where it attaches to B322-11 plate. Remove hardware securing antenna to plate and remove antenna.

Installation

1. Turn battery & avionics switches off and pull out XPDR (3 amp) circuit breaker on circuit breaker panel.
2. Remove paint & primer from between cabin skin and B322-11 plate to ensure electrical ground.
3. If not previously accomplished, install hardware securing transponder antenna to plate. Verify security. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to plate and allow to dry.
4. Connect antenna cable to antenna and install screws securing plate & antenna to cabin skin. Verify security.
5. Perform ground checks per Part D step 7.

F. Scheduled Maintenance and Inspections

NOTE

All factory-installed Garmin units are “on condition” and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 97-80 for avionics software information.

G. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel, hinge left seat forward, and remove F748-1 cover assembly.
2. Inspect condition of and verify no obvious damage to transponder, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel. Perform ground checks per Part D step 7.

97-25 Garmin GDL 88 ADS-B In Transceiver

> NOTE
>
> Refer to Garmin GDL 88 Maintenance Manual and Instructions for Continued Airworthiness.

A. Description

The GDL 88 is a remote-mounted Universal Access Transceiver (UAT) and is configured for ADS-B in only. This provides reception of other aircraft traffic broadcasts (1090 or 978 MHz), Flight Information Service Broadcast (FIS-B weather, TFRs, etc., 978 MHz), and Traffic Information Service Broadcast (TIS-B, 978 MHz). ADS-B in information is accessed and displayed on an available GTN display; refer to § 97-30.

B. Schematic

Refer to Figure 98-22 for GDL 88 ADS-B Installation electrical schematic.

C. Removal

1. Turn battery switch off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Under left front seat, disconnect airframe harness from GDL 88 receiver at connectors.
3. Remove screws securing GDL 88 receiver to C904-1 mount assembly, and remove GDL 88 receiver.

D. Installation

1. Turn battery switch off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Under left front seat, position GDL 88 receiver on C904-1 mount assembly and install screws. Verify security.
3. Connect airframe harness to GDL 88 receiver at connectors.
4. Push in XPDR (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GDL 88 Pilot's Guide. Turn battery & avionics switches off.

97-25 Garmin GDL 88 ADS-B In Transceiver (continued)

E. Antenna

Refer to § 6-80 for antenna locations and R66 Illustrated Parts Catalog (IPC) Chapter 6.

NOTE
Antenna installation depends on number of COM installations and additional equipment installed.

Removal

1. Turn battery switch off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Using plastic scraper, remove B270-1 sealant from around GDL 88 antenna at corners where it attaches to belly.
3. Disconnect antenna cable from antenna. Remove hardware securing antenna to belly and remove antenna.

Installation

1. Turn battery switch off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Remove paint & primer from antenna mating surfaces to ensure electrical ground.
3. Install hardware securing antenna to belly. Apply small bead B270-1 sealant around antenna at corners where it attaches to belly and allow to dry.
4. Connect antenna cable to antenna. Verify security.
5. Perform ground checks per Part D steps 4 and 5.

F. Scheduled Maintenance and Inspections

NOTE
All factory-installed Garmin units are “on condition” and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE
Refer to § 97-80 for avionics software information.

97-25 Garmin GDL 88 ADS-B In Transceiver (continued)

G. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel and access left front seat.
2. Inspect condition of and verify no obvious damage to GDL 88, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel and left front seat. Perform ground checks per Part D steps 4 and 5.

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97-30 Navigation and GPS Systems

97-31 Garmin GTN 6XX/7XX series GPS

NOTE

Refer to Garmin GTN 6XX/7XX series Maintenance Manual and Instructions for Continued Airworthiness.

A. Description

The GTN 6XX/7XX WAAS navigators are a family of panel-mounted GPS/NAV/COM navigators. GTN 6XX units include the GTN 625, GTN 635, and GTN 650 which feature a 4.9-inch color LCD touchscreen. GTN7XX units include the GTN 725 and GTN 750 which feature a 6.9-inch color LCD touchscreen. The GTN 625/725 are a GPS/SBAS unit that meets the requirements of TSO-C146c. The GTN 635 includes all of the features of the GTN 625 in addition to an airborne VHF communications transceiver. The GTN 650/750 include all of the features of the GTN 625/725 in addition to an airborne VHF communications transceiver and airborne VOR/LOC and GS receivers.

B. Schematic

Refer to Figure 98-12A, 98-13, or 98-23 as applicable for GTN 6XX/7XX series GPS installation electrical schematic.

C. Removal

1. Turn battery & avionics switches off and pull out GPS 1 (5 amp) and GPS 2 (5 amp) circuit breakers as required on circuit breaker panel.
2. Insert hex key through face to loosen anchor screw attaching GTN to tray in upper or pilot's-side console.
3. Carefully unplug/remove GTN from tray.

D. Installation

1. Turn battery & avionics switches off and pull out GPS 1 (5 amp) and GPS 2 (5 amp) circuit breakers as required on circuit breaker panel.
2. Carefully plug-in/install GTN in appropriate location in tray in upper or pilot's-side console.
3. Insert hex key through face to tighten anchor screw attaching GTN to tray. Verify equipment security.
4. Push in GPS 1 (5 amp) and GPS 2 (5 amp) circuit breakers as required on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GTN 6XX/7XX series Pilot's Guide. Turn battery & avionics switches off.

97-31 Garmin GTN 6XX/7XX series GPS (continued)

E. Antenna

Refer to § 6-80 for antenna locations and R66 Illustrated Parts Catalog (IPC) Chapter 6.

NOTE
Antenna installation depends on number of COM installations and additional equipment installed.

Removal

1. Turn battery & avionics switches off and pull out GPS 1 (5 amp) and GPS 2 (5 amp) circuit breakers as required on circuit breaker panel.
2. GPS antenna:
   a. Using plastic scraper, remove B270-1 sealant from around GPS antenna at corners where it attaches to tailcone.
   b. As required, remove B270-13 sealant from fastener holes. Remove hardware securing antenna to tailcone.

   NAV antenna:
   a. Remove hardware (including spacers) securing antenna to tailcone.

   Glideslope antenna:
   a. Remove screws securing antenna to chin.
3. Disconnect cable from antenna. Temporarily secure cable as required for later installation.

Installation

1. Turn battery & avionics switches off and pull out GPS 1 (5 amp) and GPS 2 (5 amp) circuit breakers as required on circuit breaker panel.
2. GPS antenna:
   a. Remove paint & primer from antenna mating surfaces to ensure electrical ground.
   b. As required, apply light coat B270-13 sealant to screw threads and install screws securing antenna to tailcone. As required, seal around screw heads and fill fastener holes using B270-13 sealant and allow to dry. Verify security.
   c. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to tailcone and allow to dry.

97-31 Garmin GTN 6XX/7XX series GPS (continued)

E. Antenna (continued)

Installation (continued)

2. NAV antenna:

   a. Install hardware and B322-10 spacers (thick edge inward) securing antenna to tailcone. Verify security.

   Glideslope antenna:

   a. Install screws securing antenna to chin. Verify security.

3. Connect antenna cable to antenna. Verify security.
4. Perform ground checks per Part D steps 4 and 5.

F. Scheduled Maintenance and Inspections

NOTE
All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE
Refer to § 97-80 for avionics software information.

G. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel and upper console.
2. Inspect condition of and verify no obvious damage to GPS(s), copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel and upper console. Perform ground checks per Part D steps 4 and 5.

97-40 Weather, Datalink, and Connected Services

97-41 Garmin GDL 69A XM Receiver

NOTE

Refer to Garmin GDL 69A XM Receiver Instructions for Continued Airworthiness.

A. Description

The GDL 69A XM Satellite Radio receives broadcast weather data and audio entertainment. The GDL 69A has no control panel face; weather data and audio controls are displayed on the G500H EFIS MFD or on the GTN 6XX/7XX series GPS navigator. The GDL 69A interfaces with the audio panel to distribute the audio signal.

A subscription to XM Satellite Radio service enables GDL 69A capability.

B. Schematic

Refer to Figure 98-17 for Garmin GDL 69A XM Receiver Installation electrical schematic.

C. Removal

1. Turn battery & avionics switches off and pull out XM (2 amp) circuit breaker on circuit breaker panel.
2. Remove hardware securing F640 face assembly to avionics panel and remove face.
3. Loosen screw and swing handle across GDL 69A receiver to unlock. Carefully unplug/remove receiver from tray.

D. Installation

1. Turn battery & avionics switches off and pull out XM (2 amp) circuit breaker on circuit breaker panel.
2. Carefully plug-in/install GDL 69A receiver in appropriate location in avionics tray.
3. Swing handle across receiver to lock and tighten screw. Verify equipment security.
4. Install hardware securing F640 face assembly to avionics panel.
5. Push in XM (2 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
6. Perform appropriate functional checks per Garmin GDL 69A XM Receiver Instructions for Continued Airworthiness. Turn battery & avionics switches off.

97-41 Garmin GDL 69A XM Receiver (continued)

E. Antenna

Refer to § 6-80 for antenna locations and R66 Illustrated Parts Catalog (IPC) Chapter 6.

NOTE
Antenna installation depends on optional equipment installed.

Removal

1. Turn battery & avionics switches off and pull out XM (2 amp) circuit breaker on circuit breaker panel.
2. Using plastic scraper, remove B270-1 sealant from around XM antenna at corners where it attaches to F706-1 cowling.
3. Remove screws securing antenna to cowling and disconnect antenna cable from antenna. Remove antenna and rubber gasket.

Installation

1. Turn battery switches off and pull out XM (2 amp) circuit breaker on circuit breaker panel.
2. Install hardware securing XM antenna (with rubber gasket) to F706-1 cowling. Verify security. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to cowling and allow to dry.
3. Connect antenna cable to antenna. Verify security.
4. Perform ground checks per Part D steps 4 and 5.

F. Scheduled Maintenance and Inspections

NOTE
All factory-installed Garmin units are “on condition” and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE
Refer to § 97-80 for avionics software information.

G. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel.
2. Remove GDL 69A XM receiver per Part C. Inspect condition of and verify no obvious damage to XM receiver, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing.
3. Secure circuit breaker panel. Install XM receiver per Part D.

97-50 Radar Altimeter Systems

97-51 FreeFlight RA-4000 and RA-4500 Radar Altimeter

A. Description

The FreeFlight RA-4000 radar altimeter displays altitude data on the RAD-40 indicator. The FreeFlight RA-4500 radar altimeter is identical to the RA-4000 except it has ARINC 429 output for communication with electronic displays; the RA-4500 can display altitude data on a RAD-45 indicator or an interfaced Garmin GDU display.

B. Schematic

Refer to Figure 98-14 for RA-4500 and Figure 98-14A for RA-4000 Radar Altimeter Installation electrical schematic.

C. Removal

RAD-40 Indicator

1. Turn battery & avionics switches off and pull out RAD ALT (2 amp) circuit breaker on circuit breaker panel.
2. Remove perimeter screws securing instrument face to upper console and carefully pull face aft, or remove Garmin GDU display (ref § 97-70).
3. a. For above-console installation: Remove hardware securing B560 enclosure assembly to instrument console and remove hardware securing B560 faceplate to RAD-40 Indicator.
   b. For in-console installation: Supporting RAD-40 indicator, remove hardware securing B421-1 visor assembly, A590-4 cover plate, and indicator to instrument face.
4. Disconnect console harness from indicator and carefully remove indicator.

ATG-410 Tone Generator

1. Turn battery & avionics switches off and pull out RAD ALT (2 amp) circuit breaker on circuit breaker panel. Open instrument console or remove Garmin GDU display per § 97-70.
2. Supporting ATG-410 tone generator, remove screws securing tone generator to keel panel. Carefully remove tone generator and disconnect console harness.

RA-4000 or RA-4500 Radar Altimeter

1. Turn battery & avionics switches off and pull out RAD ALT (2 amp) circuit breaker on circuit breaker panel. Hinge front left seat forward.
2. Disconnect airframe and antenna harnesses from RA-4000 or RA-4500 radar altimeter.
3. Supporting radar altimeter, remove screws securing radar altimeter to F542-2 support. Carefully remove radar altimeter from under left seat.

97-51 FreeFlight RA-4000 and RA-4500 Radar Altimeter (continued)

D. Installation

RAD-40 Indicator

1. Turn battery & avionics switches off and pull out RAD ALT (2 amp) circuit breaker on circuit breaker panel.
2. Connect console harness to RAD-40 Indicator.
3. a. For above-console installation: Install hardware securing B560 faceplate to indicator & install hardware securing B560 enclosure assembly to instrument console.
   b. For in-console installation: Supporting indicator, install hardware securing B421-1 visor assembly, A590-4 cover plate, and indicator to instrument face.
4. Install perimeter screws securing instrument face to upper console or install Garmin GDU display (ref § 97-70).
5. Push in RAD ALT (2 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
6. Perform appropriate functional checks per Freeflight Systems Instructions for Continued Airworthiness. Turn battery & avionics switches off.

ATG-410 Tone Generator

1. Turn battery & avionics switches off and pull out RAD ALT (2 amp) circuit breaker on circuit breaker panel.
2. Connect console harness to ATG-410 tone generator.
3. Position tone generator on keel panel and install screws. Verify security.
4. Close instrument console or install Garmin GDU display per § 97-70.
5. Push in RAD ALT (2 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
6. Perform appropriate functional checks per Freeflight Systems Instructions for Continued Airworthiness. Turn battery & avionics switches off.

RA-4000 or RA-4500 Radar Altimeter

1. Turn battery & avionics switches off and pull out RAD ALT (2 amp) circuit breaker on circuit breaker panel.
2. Connect airframe and antenna harnesses to radar altimeter.
3. Supporting RA-4000 or RA-4500 radar altimeter, install screws securing radar altimeter to F542-2 support. Verify security. Hinge front left seat aft.
4. Push in RAD ALT (2 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Freeflight Systems Instructions for Continued Airworthiness. Turn battery & avionics switches off.

97-51 FreeFlight RA-4000 and RA-4500 Radar Altimeter (continued)

E. Antenna

Refer to § 6-80 for antenna locations and R66 Illustrated Parts Catalog (IPC) Chapter 6.

Removal

1. Turn battery & avionics switches off and pull out RAD ALT (2 amp) circuit breaker on circuit breaker panel.
2. Remove hardware securing F469 scuff plate and carpet assembly to floor, remove plate, and peel back carpet as required. Remove hole plug.
3. Disconnect antenna cable from antenna.
4. Remove screws securing antenna to chin. Repeat steps for opposite-side antenna.

Installation

1. Turn battery & avionics switches off and pull out RAD ALT (2 amp) circuit breaker on circuit breaker panel.
2. Connect antenna cable to antenna and install screws securing antenna to chin. Verify security.
3. Install floor hole plug. Install hardware securing F469 scuff plate and carpet assembly to floor. Repeat steps for opposite-side antenna.
4. Push in RAD ALT (2 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Freeflight Systems Instructions for Continued Airworthiness. Turn battery & avionics switches off.

F. Scheduled Maintenance and Inspections

Refer to FreeFlight Systems Instructions for Continued Airworthiness.

G. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel. Open instrument console, remove perimeter screws securing instrument face to upper console, or remove Garmin GDU display (ref § 97-70). Hinge front left seat forward as required.
2. Inspect condition of and verify no obvious damage to RAD-40 Indicator, ATG-410 Tone Generator, RA-4000 or RA-4500 Radar Altimeter, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel and close instrument console, install perimeter screws securing instrument face to upper console, or install Garmin GDU display (ref § 97-70). Hinge front left seat aft as required.

97-52 Garmin GRA 55 Radar Altimeter

A. Description

The GRA 55 radar altimeter is a digital low-range altimeter designed to calculate and provide precise above-ground-level (AGL) altitude. Altitude data are provided via ARINC 429 to the Garmin GDU display.

B. Schematic

Refer to Figure 98-14B for GRA 55 Radar Altimeter electrical schematic.

C. Removal

1. Turn battery & avionics switches off and pull out RAD ALT (2 amp) circuit breaker on circuit breaker panel.
2. Hinge front left seat forward.
3. As required, remove hardware securing F748-1 cover assembly under front left seat and remove from helicopter.
4. Disconnect wiring harness and antenna cables from GRA 55 altimeter.
5. While supporting altimeter, rotate lockdown-mechanism collar counterclockwise to loosen; pull out lockdown mechanism and disengage from front of altimeter.
6. Slide altimeter toward front side to release from mounting rack and remove from helicopter.

D. Installation

1. Turn battery & avionics switches off and pull out RAD ALT (2 amp) circuit breaker from circuit breaker panel.
2. Hinge front left seat forward.
3. If not previously accomplished, install hardware securing GRA 55 altimeter's mounting rack under front left seat.
4. Align altimeter with mounting rack. Ensure altimeter is fully seated in rack, then pull lockdown mechanism collar over altimeter's hook. Hand-tighten lockdown mechanism. Verify security.
5. Connect antenna cables and airframe wiring harness.
6. As required, install hardware securing F748-1 cover assembly under front left seat. Verify security.
7. Hinge front left seat backward.
8. Push in RAD ALT (2 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
9. Perform calibration and testing specified by Garmin GRA 55 System Maintenance Manual.

97-52 Garmin GRA 55 Radar Altimeter (continued)

E. Antenna

Refer to R66 Illustrated Parts Catalog (IPC) Chapter 6 for antenna locations.

Removal (standard location)

1. Turn battery & avionics switches off and pull out RAD ALT (2 amp) circuit breaker on circuit breaker panel.
2. Remove pilot- or copilot-side carpet and scuff plate from floor per § 25-30, as required. Remove hole plug.
3. Disconnect antenna cable from antenna, and remove screws securing antenna to chin. Repeat steps for opposite-side antenna as required.

Removal (alternate location)

1. Turn battery & avionics switches off and pull out RAD ALT (2 amp) circuit breaker on circuit breaker panel.
2. Hinge front left or front right seat forward as required.
3. On left side, remove hardware securing F748-1 cover assembly under seat as required, and remove from helicopter. On right side, remove G702 cover assembly as required, and remove from helicopter.
4. Disconnect antenna cable from antenna, and remove screws securing antenna to chin. Repeat steps for opposite-side antenna as required.

Installation (standard location)

1. Turn battery & avionics switches off and pull out RAD ALT (2 amp) circuit breaker on circuit breaker panel.
2. Connect antenna cable to antenna and install screws securing antenna to chin. Verify security.
3. Install hole plug. Install carpet and scuff plate per § 25-30. Repeat steps for opposite-side antenna as required.
4. Push in RAD ALT (2 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform calibration and testing specified by Garmin GRA 55 System Maintenance Manual.

97-52 Garmin GRA 55 Radar Altimeter (continued)

E. Antenna (continued)

Installation (alternate location)

1. Turn battery & avionics switches off and pull out RAD ALT (2 amp) circuit breaker on circuit breaker panel.
2. Connect antenna cable to antenna and install screws securing antenna to chin. Repeat steps for opposite-side antenna as required.
3. On left side, install hardware securing F748-1 cover assembly under seat as required. On right side, install hardware securing G702 cover assembly as required.
4. Hinge front left or front right seat back as required.
5. Push in RAD ALT (2 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
6. Perform calibration and testing specified by Garmin GRA 55 System Maintenance Manual.

F. Scheduled Maintenance and Inspections

Refer to Garmin GRA 55 System Maintenance Manual.

97-60 Electronic Flight Instrument Systems (EFIS)

97-61 Aspen EFD500H & EFD1000H (EFIS)

A. Description

R66 options include a single screen Aspen PFD, or a dual-screen Aspen PFD and MFD.

The Aspen PFD (Primary Flight Display) is an LCD unit with displays for attitude, altitude, airspeed, heading, and optional NAV (HSI/CDI). The Aspen PFD is a situational awareness aid, to be used in conjunction with required VFR instruments (altimeter, airspeed indicator, and magnetic compass).

The standard Aspen PFD installation configures the lower half of the display as a directional gyro. An optional installation configures the lower half of the display to a Horizontal Situation Indicator (HSI). Primary GPS position data is provided by GTN-series GPS. Heading and outside air temperature data is received from the Aspen remote sensor module (RSM). The RSM provides backup GPS position data if primary GPS fails.

The Aspen MFD (Multifunction Display) is an LCD unit with displays for moving map navigation data, terrain, and traffic. Terrain and traffic may also be overlaid on moving map. GPS position data is provided by Garmin GTN-series GPS for moving map and terrain displays. Aspen MFD also includes an internal terrain database. TIS-A traffic data may be received from Garmin GTX 330 or 3X5 transponder for moving map display.

B. Schematics

Refer to Figure 98-19 for Aspen EFD500H Display Installation electrical schematic, and Figure 98-18 for Aspen EFD1000H Display Installation electrical schematic.

Refer to Figures 95-9 or 95-10 for Aspen PFD pitot-static schematic, and Figure 95-11 for Aspen PFD & MFD pitot-static schematic.

C. Removal

1. Turn battery switch off and pull-out EFIS circuit breaker (7.5 amp) on circuit breaker panel.
2. Gently depress blue tab(s) at top of Aspen PFD/MFD to release display(s) from mounting bracket(s).
3. PFD only: Disconnect pitot and static lines from display using quick-disconnect couplers. Temporarily cap pitot and static line fittings at display and in aircraft to prevent contamination.
4. Loosen screws securing airframe wiring harness connector(s) to display(s), unplug connector(s), and remove display(s).

97-61 Aspen EFD500H & EFD1000H (EFIS; continued)

D. Installation

1. Turn battery switch off and pull-out EFIS circuit breaker (7.5 amp) on circuit breaker panel.
2. Plug airframe wiring harness connector(s) into Aspen PFD/MFD display(s) and tighten screws. Verify security.
3. PFD only: Remove temporary fitting caps and connect pitot and static lines to display using quick-disconnect couplers.
4. Insert display(s) into mounting bracket(s) until blue tab(s) snap(s) into place. Verify security.
5. Push-in EFIS circuit breaker (7.5 amp) on circuit breaker panel. Turn battery & avionics switches on.
6. Perform appropriate functional checks per Aspen EFD1000H PFD / EFD500H MFD Pilot's Guide. Turn battery & avionics switches off.
7. Perform pitot-static leak check.

E. Remote Sensor Module (RSM) Antenna

NOTE
Do not use magnetized tools.

Removal

1. Turn battery switch off and pull-out EFIS circuit breaker (7.5 amp) on circuit breaker panel.
2. Refer to § 6-80 for antenna locations. Using plastic scraper, remove B270-1 sealant from around EFIS antenna at corners where it attaches to tailcone.
3. Cut and discard ty-raps as required and disconnect antenna cable at connectors (secured to frame). Remove screws securing antenna and antenna ground wire to tailcone and remove antenna.

Installation

1. Turn battery switch off and pull-out EFIS circuit breaker (7.5 amp) on circuit breaker panel.
2. Remove paint & primer from antenna and antenna ground wire mating surfaces to ensure electrical ground.
3. Install screws securing antenna and antenna ground wire to tailcone. Verify security.
4. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to tailcone and allow to dry.
5. Connect antenna cable at connectors; secure to frame using ty-raps. Verify security.
6. Perform ground checks per Part D steps 5 and 6.

97-61 Aspen EFD500H & EFD1000H (EFIS; continued)

F. Scheduled Maintenance and Inspections

Maintenance is on condition. Contact Aspen Avionics at www.aspenavionics.com for instructions for continued airworthiness.

NOTE

Refer to § 97-80 for avionics software information.

G. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel and upper console.
2. Inspect condition of and verify no obvious damage to Aspen displays, pitot-static lines, metal braiding, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel and upper console. Perform ground checks per Part D steps 5 and 6.

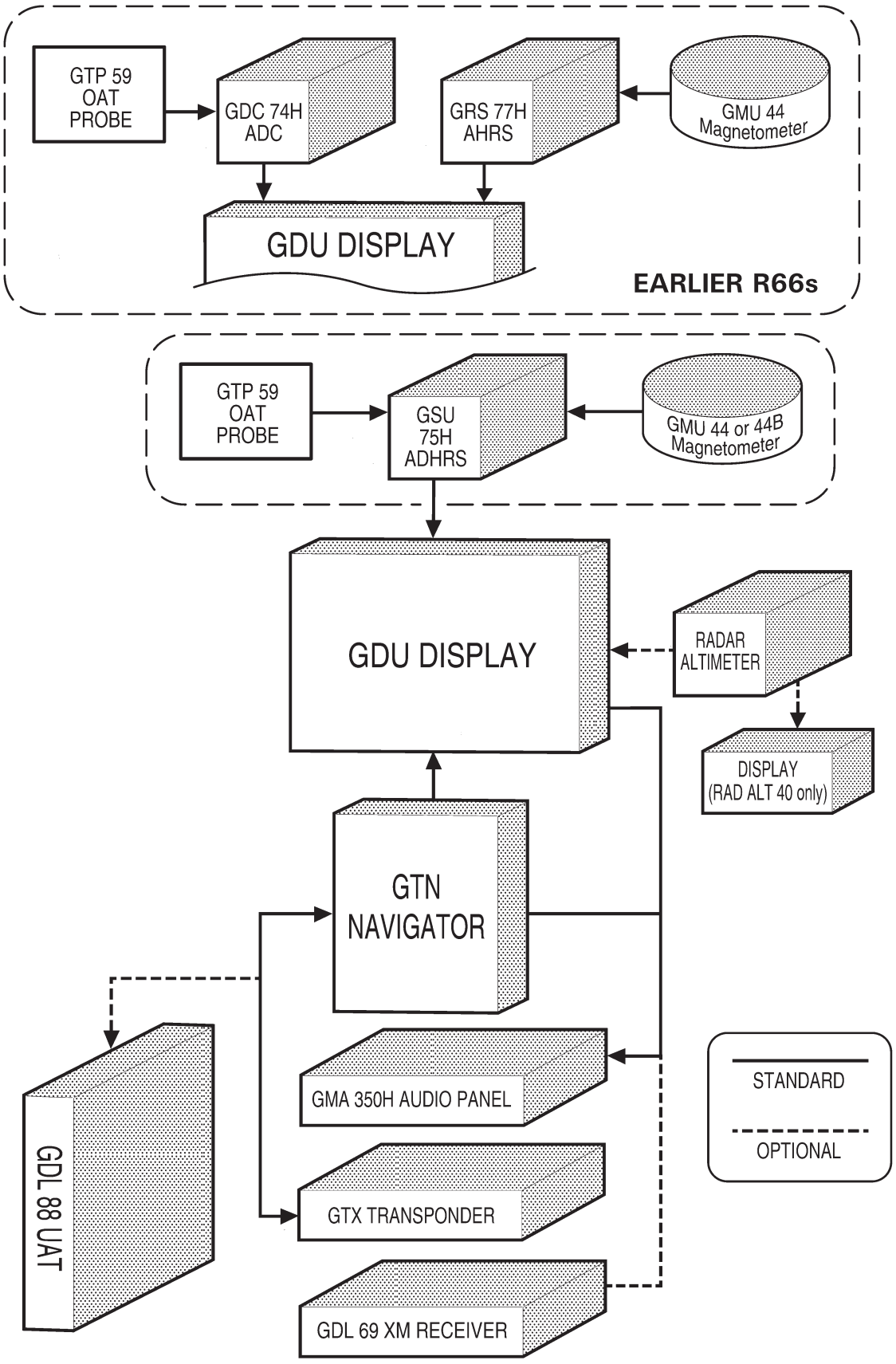


FIGURE 97-1 GARMIN G500H EFIS – BLOCK DIAGRAM

97-62 Garmin G500H EFIS

NOTE

Refer to Garmin G500H Instructions for Continued Airworthiness.

A. Description

The G500H is an integrated display system that provides flight instrument, moving-map navigation, and additional situational awareness information to the flight crew via a Garmin Display Unit (GDU). The GDU receives information from remote-mounted Line Replaceable Unit (LRU) avionics boxes. Refer to Figure 97-1 for typical primary and optionally connected LRUs; refer to appropriate sections for other connected equipment for more information.

B. Schematics

Refer to Figure 98-12A or 98-13 for applicable G500H installation electrical schematic.

C. Removal

Refer to § 97-70 for appropriate interface equipment removal instructions.

D. Installation

Refer to § 97-70 for appropriate interface equipment installation instructions.

E. Pitch/Roll Offset Calibration

NOTE

A Garmin Installer Unlock card is required to perform this procedure.

NOTE

All factory-installed Garmin units are configured to each helicopter. Perform only the steps outlined in this procedure without making additional changes.

1. Ensure GDU is off, then insert Garmin's Installer Unlock card in lower/left slot.
2. Press and hold right-inner knob, then press and release power button. After screen turns on, release right-inner knob.
3. Ensure external LRUs are online, indicated by green boxes on left side of display.
4. Press *Attitude/Heading*, *Calibration/Test*.
5. Select **Pitch/Roll Offset** procedure.

97-62 Garmin G500H EFIS (continued)

E. Pitch/Roll Offset Calibration (continued)

6. Follow and confirm each on-screen instruction.

NOTE
Verify aircraft is positioned on skids on level ground.

7. Press **Calibrate** and confirm successful calibration.
8. Press **Close**, power off GDU, then remove Installer Unlock card.

F. Magnetometer Calibration

NOTE
This procedure must be performed during a flight check.

NOTE
A Garmin Installer Unlock card is required to perform this procedure.

NOTE
All factory-installed Garmin units are configured to each helicopter. Perform only the steps outlined in this procedure without making additional changes.

NOTE
If helicopter has Garmin GFC 600H Helicopter Flight Control System (FCS) installed, refer to § 22-16-2 Part D and perform FCS and GDU magnetometer calibration simultaneously.

1. If not previously accomplished, perform Pitch/Roll Offset Calibration per Part E.
2. Ensure GDU is off, then insert Garmin's Installer Unlock card in lower/left slot.
3. Press and hold right-inner knob, then press and release power button. After screen turns on, release right-inner knob.
4. Ensure external LRUs are online, indicated by green boxes on left side of display.
5. Press *Attitude/Heading*, *Calibration/Test*.
6. Select **Magnetometer** procedure.
7. Read thru on-screen checklist and confirm each instruction.
8. Press **Calibrate**.

97-62 Garmin G500H EFIS (continued)

F. Magnetometer Calibration (continued)

9. With appropriately rated person at controls, start helicopter. Follow on-screen procedure until **Calibration Successful** is displayed, then press close to exit.
10. Have pilot land the helicopter. Press and hold power button to power off, then remove the Installer Unlock card.
11. Press power button to power on GDU in normal mode. Have pilot rotate helicopter and verify alignment with analog compass.
12. Have pilot complete flight check if required, or land and shut down helicopter.

G. Scheduled Maintenance and Inspections

Refer to applicable sections of § 97-70 for each installed interfacing equipment.

H. Special Maintenance and Inspections

Refer to applicable sections of § 97-70 for each installed interfacing equipment.

97-70 Avionics Source and Interface Equipment

97-71 Garmin GDC 74H Air Data Computer

A. Description

The Garmin GDC 74H Air Data Computer (ADC) compiles information from the pitot-static system and an Outside Air Temperature (OAT) sensor. The GDC 74H computer provides pressure altitude, airspeed, vertical speed, and OAT information to the G500H EFIS system. The GDC 74H computer communicates with the GDU display and GRS 77H AHRS using an ARINC 429 digital interface.

B. Schematic

Refer to Figure 98-11 for GDC 74H Air Data Computer Installation electrical schematic.

C. Removal

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker panel.
2. As required, remove hardware securing F748-1 cover assembly under front left seat and remove from helicopter.
3. Disconnect airframe harness from GDC 74H air data computer at connectors.
4. Disconnect pitot and static tube fittings from computer and plug fittings.
5. Remove screws securing computer to F950-2 support assembly. Carefully remove computer from under left seat.

D. Installation

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker panel.
2. Place GDC 74H air data computer on F950-2 support assembly and install screws. Verify security.
3. Remove plugs from fittings and connect pitot and static tube fittings to computer. Verify security. Perform pitot and static system leak checks per § 95-30.
4. Connect airframe harness to computer at connectors.
5. Push in EFIS (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
6. Perform appropriate functional checks per Garmin G500H Instructions for Continued Airworthiness. Turn battery & avionics switches off.
7. As required, position F748-1 cover under copilot's seat and secure with hardware. Hinge left seat back.

97-71 Garmin GDC 74H Air Data Computer (continued)

E. Scheduled Maintenance and Inspections

Refer to Garmin G500H EFIS Maintenance Manual, Section 5 Periodic Maintenance.

NOTE

All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 97-80 for avionics software information.

F. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel, hinge left seat forward, and remove F748-1 cover assembly.
2. Inspect condition of and verify no obvious damage to Garmin GDC 74H Air Data Computer, pitot-static tubes, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel. Perform ground checks per Part D steps 5 thru 7.

97-72 Garmin GRS 77H AHRS

A. Description

The Garmin GRS 77H Attitude and Heading Reference System (AHRS) provides aircraft attitude information to the G500H EFIS system. The GRS 77H interfaces with both the GDC 74H Air Data Computer and the GMU 44 magnetometer. The GRS 77H also utilizes GPS data forwarded from the GDU 620. Actual attitude and heading information is sent to the GDU 620 using an ARINC 429 digital interface.

B. Schematic

Refer to Figure 98-12 for GRS 77H AHRS Installation electrical schematic.

C. Removal

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker panel.
2. Hinge left seat forward and remove F950-3 cover assembly.
3. Disconnect airframe harness from GRS 77H AHRS at connectors.
4. Loosen thumbscrews securing AHRS to F950-1 support assembly. Carefully remove AHRS from under left seat.

D. Installation

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker panel.
2. Place GRS 77H AHRS on F950-1 support assembly and tighten thumbscrews. Verify security.
3. Connect airframe harness to GRS 77H AHRS at connectors.
4. Push in EFIS (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin G500H Instructions for Continued Airworthiness. Turn battery & avionics switches off.
6. Install F950-3 cover assembly and hinge left seat back.

97-72 Garmin GRS 77H AHRS (continued)

E. Scheduled Maintenance and Inspections

Refer to Garmin G500H EFIS Maintenance Manual, Section 5 Periodic Maintenance.

NOTE

All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 97-80 for avionics software information.

F. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel, hinge left seat forward, and remove F950-3 cover assembly.
2. Inspect condition of and verify no obvious damage to Garmin GRS 77H AHRS, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel. Perform ground checks per Part D steps 4 thru 6.

97-73 Garmin GSU 75H ADAHRS

A. Description

The Garmin GSU 75H ADAHRS (Air Data, Attitude and Heading Reference System) is a remote-mounted device that provides flight altitude, airspeed, attitude, and heading data for flight instrumentation in ARINC 429 format. The GSU 75H also provides operating current to the GTP 59 OAT Probe and operating voltage to the GMU 44 or GMU 44B magnetometer.

B. Schematic

Refer to Figure 98-10 for GSU 75H ADAHRS Installation electrical schematic.

C. Removal

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker panel.
2. Hinge front left seat forward.
3. As required, remove hardware securing F748-1 cover assembly under front left seat and remove from helicopter.
4. Remove GTX 345R transponder per § 97-24, if installed.
5. Remove GRA 55 radar altimeter per § 97-52, if installed.
6. Disconnect pitot and static tubes and wiring harness connector from GSU 75H. Temporarily cap or plug all tubes and fittings.
7. Loosen two retention screws at outboard side of GSU 75H to release, then slide outboard and up to remove from helicopter.

D. Installation

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker panel.
2. If not previously accomplished, install 117-00608-00 rack on F950-9 support assembly using (4) MS27039C1-06 screws. Install Garmin GSU mount on F950-9 assembly.
3. Position GSU 75H on mounting rack and slide unit inboard until mounting tabs are fully engaged with rack. Push down and tighten both retention screws equally finger tight, then torque screws to 15-20 in.-lb. Verify security.
4. Remove temporary caps or plugs from pitot and static lines and fittings. Connect pitot and static tubes to unit, and verify security.
5. Connect wiring harness connector to unit and verify security.

97-73 Garmin GSU 75H ADAHRS (continued)

D. Installation (continued)

6. As required, install GRA 55 radar altimeter per § 97-52.
7. As required, install GTX 345R transponder per § 97-24.
8. As required, position F748-1 cover under copilot's seat and secure with hardware.
9. Hinge front left seat backward.
10. Push in EFIS (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
11. Refer to § 97-70. Power-on the Garmin GDU and verify the built-in test for GSU 75H passes. Turn battery & avionics switches off.
12. Perform pitot-static system leak check per § 95-30.

E. Scheduled Maintenance and Inspections

Refer to Garmin G500H EFIS Maintenance Manual, Section 5 Periodic Maintenance.

NOTE

All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 97-80 for avionics software information.

F. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel, hinge left seat forward, and remove F748-1 cover assembly.
2. Inspect condition of and verify no obvious damage to Garmin GRS 75H ADAHRS, pitot-static tubes, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel. Perform ground checks per Part D steps 10 thru 12.

97-74 Garmin GMU 44 and 44B Magnetometer

A. Description

The GMU 44 or 44B magnetometer is a remote-mounted device that provides heading data to the AHRS (GRS 77H via RS-485) or ADAHRS (GSU 75H via RS-422), which is then provided to the PFD. The GMU measures the magnitude of the local magnetic field in three axes and also measures its pitch and roll angles relative to the surface of the earth. The GMU receives power from the connected AHRS or ADAHRS.

B. Schematic

Refer to Figure 98-10 for GMU 44B & GSU 75H ADAHRS Installation electrical schematic or Figure 98-10A for GMU 44 & GSU 75 ADAHRS Installation electrical schematic.

Refer to Figure 98-12 for GMU 44 & GRS 77H AHRS Installation electrical schematic.

C. Removal

Installed in Tailcone Bay 1

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker panel.
2. Remove tailcone cowling per § 53-23.
3. Supporting magnetometer, remove hardware securing magnetometer to F950-4 bracket.
4. Remove MS21919WDG12 clamp and disconnect magnetometer harness from F951-1 harness assembly at connectors. Remove magnetometer.

Installed in Tailcone Bay 2

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker panel.
2. Remove tailcone assembly per § 53-40 Part A.
3. Remove tail rotor drive shaft assembly per § 65-20 Part A.
4. As required, remove hardware and MS21919WDG3 clamps or MS21919WDG12 clamp securing F951-2 or -5 wiring harness.
5. Remove hardware securing GMU 44 to F950-4 bracket or GMU 44B to F950-20 bracket.
6. Cut & discard ty-rap locking connector and disconnect wiring harness. Remove GMU from tailcone.

97-74 Garmin GMU 44 and 44B Magnetometer (continued)

D. Installation

Installed in Tailcone Bay 1

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker panel.
2. Position MS21919WDG12 clamp on magnetometer connector.
3. Install hardware securing magnetometer to F950-4 bracket. Verify security.
4. Connect F951-1 harness assembly to magnetometer harness at connectors.
5. Push in EFIS (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
6. Perform appropriate functional checks per Garmin G500H Instructions for Continued Airworthiness. Turn battery & avionics switches off.
7. Install tailcone cowling per § 53-23.

Installed in Tailcone Bay 2

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker panel.
2. Position GMU 44B magnetometer on F950-20 bracket assembly, or GMU 44 magnetometer on F950-4 bracket assembly, and install hardware securing magnetometer to bracket. Verify security.
3. Connect F951-5 or -2 harness to magnetometer at connectors. Lock GMU 44B wiring and F951-5 wiring connectors using MS3367-4-9 ty-rap, if installed.
4. Install hardware and MS21919WDG3 and/or MS21919WDG12 clamps, as required, securing wiring to bracket and tailcone.
5. Install tail-rotor drive shaft assembly per § 65-20 Part B.
6. Install tailcone assembly per § 53-40 Part B.
7. Push in EFIS (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
8. Perform appropriate functional checks per Garmin G500H Instructions for Continued Airworthiness. Turn battery & avionics switches off.

97-74 Garmin GMU 44 and 44B Magnetometer (continued)

E. Scheduled Maintenance and Inspections

Refer to Garmin G500H EFIS Maintenance Manual, Section 5 Periodic Maintenance.

NOTE

All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 97-80 for avionics software information.

F. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel and remove tailcone cowling per § 53-23.
2. Inspect condition of and verify no obvious damage to magnetometer, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel. Perform appropriate functional checks per Garmin G500H Instructions for Continued Airworthiness.

97-75 Garmin GDU 620

NOTE

Refer to Garmin G500H Instructions for Continued Airworthiness.

A. Description

The GDU 620 electronically displays primary flight instrumentation via a primary flight display (PFD), and moving map, weather, traffic, terrain and other functionality via a multifunction display (MFD) on dual 6.5 inch displays.

The dual screen display is divided into a Primary Flight Display (PFD) with airspeed, altitude, vertical speed, attitude, and heading information and a Multifunction Display (MFD) which typically displays moving-map navigation data and can also display supplementary information such as weather, traffic, and terrain.

B. Schematics

Refer to Figure 98-9B for GDU 620 installation electrical schematic.

C. Removal

1. Turn battery & avionics switches off and pull out EFIS circuit breaker (5 amp) on circuit breaker panel.
2. Remove screws securing GDU to console face.
3. Pull out and support display, unplug console harness connectors, and remove display.

D. Installation

1. Turn battery & avionics switches off and pull out EFIS circuit breaker (5 amp) on circuit breaker panel.
2. Visually inspect console harness connectors and verify no bent or damaged pins. Support display and plug in console harness connectors.
3. Place GDU in console, then install and tighten screws. Verify security.
4. Push in EFIS circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin G500H Instructions for Continued Airworthiness. Turn battery & avionics switches off.

97-75 Garmin GDU 620 (continued)

E. Scheduled Maintenance and Inspections

Refer to Garmin G500H Instructions for Continued Airworthiness.

NOTE

All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 97-80 for avionics software information.

F. Special Maintenance and Inspections

1. Remove GDU per Part C.
2. Open circuit breaker panel and upper console.
3. Inspect condition of and verify no obvious damage to GDU, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify installed equipment security.
4. Secure circuit breaker panel and upper console.
5. Install GDU per Part D.

97-76 Garmin GDU 1060 TXi

NOTE

Refer to Garmin G500H Instructions for Continued Airworthiness.

A. Description

The GDU 1060 TXi electronically displays primary flight instrumentation via a primary flight display (PFD), and moving map, weather, traffic, terrain, and other functionality via a multifunction display (MFD) that includes touch-screen technology on one 10.6 inch display.

B. Schematics

Refer to Figure 98-9 and 98-9A for applicable GDU 1060 installation electrical schematic.

C. Removal

1. Turn battery & avionics switches off and pull out EFIS circuit breaker (5 amp) on circuit breaker panel.
2. Remove screws securing GDU to console face.
3. Pull out and support display, unplug console harness connectors, and remove display.

D. Installation

1. Turn battery & avionics switches off and pull out EFIS circuit breaker (5 amp) on circuit breaker panel.
2. Visually inspect console harness connectors and verify no bent or damaged pins. Support display and plug in console harness connectors.
3. Place GDU in console, then install and tighten screws. Verify security.
4. Push in EFIS circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin G500H Instructions for Continued Airworthiness. Turn battery & avionics switches off.

97-76 Garmin GDU 1060 TXi (continued)

E. Scheduled Maintenance and Inspections

Refer to Garmin G500H Instructions for Continued Airworthiness.

NOTE
All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE
Refer to § 97-80 for avionics software information.

F. Special Maintenance and Inspections

1. Remove GDU per Part C.
2. Open circuit breaker panel and upper console.
3. Inspect condition of and verify no obvious damage to GDU, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify installed equipment security.
4. Secure circuit breaker panel and upper console.
5. Install GDU per Part D.

97-77 Garmin GDU 700L TXi |

NOTE

Refer to Garmin G500H Instructions for Continued Airworthiness.

A. Description

The GDU 700L electronically displays primary flight instrumentation via a primary flight display (PFD), and moving map, weather, traffic, terrain, and other functionality via a multifunction display (MFD) that includes touch-screen technology on one 7 inch display.

B. Schematics

Refer to Figure 98-9 and 98-9A for applicable GDU 700L installation electrical schematic. |

C. Removal

1. Turn battery & avionics switches off and pull out EFIS circuit breaker (5 amp) on circuit breaker panel.
2. Remove screws securing GDU to console face.
3. Pull out and support display, unplug console harness connectors, and remove display.

D. Installation

1. Turn battery & avionics switches off and pull out EFIS circuit breaker (5 amp) on circuit breaker panel.
2. Visually inspect console harness connectors and verify no bent or damaged pins. Support display and plug in console harness connectors.
3. Place GDU in console, then install and tighten screws. Verify security.
4. Push in EFIS circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin G500H Instructions for Continued Airworthiness. Turn battery & avionics switches off.

97-77 Garmin GDU 700L TXi (continued)

E. Scheduled Maintenance and Inspections

Refer to Garmin G500H Instructions for Continued Airworthiness.

NOTE

All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 97-80 for avionics software information.

F. Special Maintenance and Inspections

1. Remove GDU per Part C.
2. Open circuit breaker panel and upper console.
3. Inspect condition of and verify no obvious damage to GDU, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify installed equipment security.
4. Secure circuit breaker panel and upper console.
5. Install GDU per Part D.

97-80 Avionics Software

Modern avionics software is complex and subject to rigorous testing by RHC to assure proper function and integration in the aircraft. Only specified software versions and software configurations have been FAA-approved for installation in Robinson helicopters. Software updates should not be attempted without a thorough understanding of approval status and compatibility. Technical support from either RHC or the avionics manufacturer will likely be required. In some cases, updating software for one item of avionics may require additional avionics to be updated to assure compatibility.

As long as RHC-installed equipment is functioning properly, there is no continuing airworthiness requirement to check or update software levels in Robinson helicopters; RHC will issue an SB (or FAA will issue an AD) for any mandatory updates.

Consult https://robinsonheli.com > Customer Support > Avionics Support > Avionics Software page for approved software configurations.

NOTE

The above statements apply to avionics operating software. Databases (e.g. charts, terrain, etc.) may be updated regularly using avionics manufacturer's recommended procedures.

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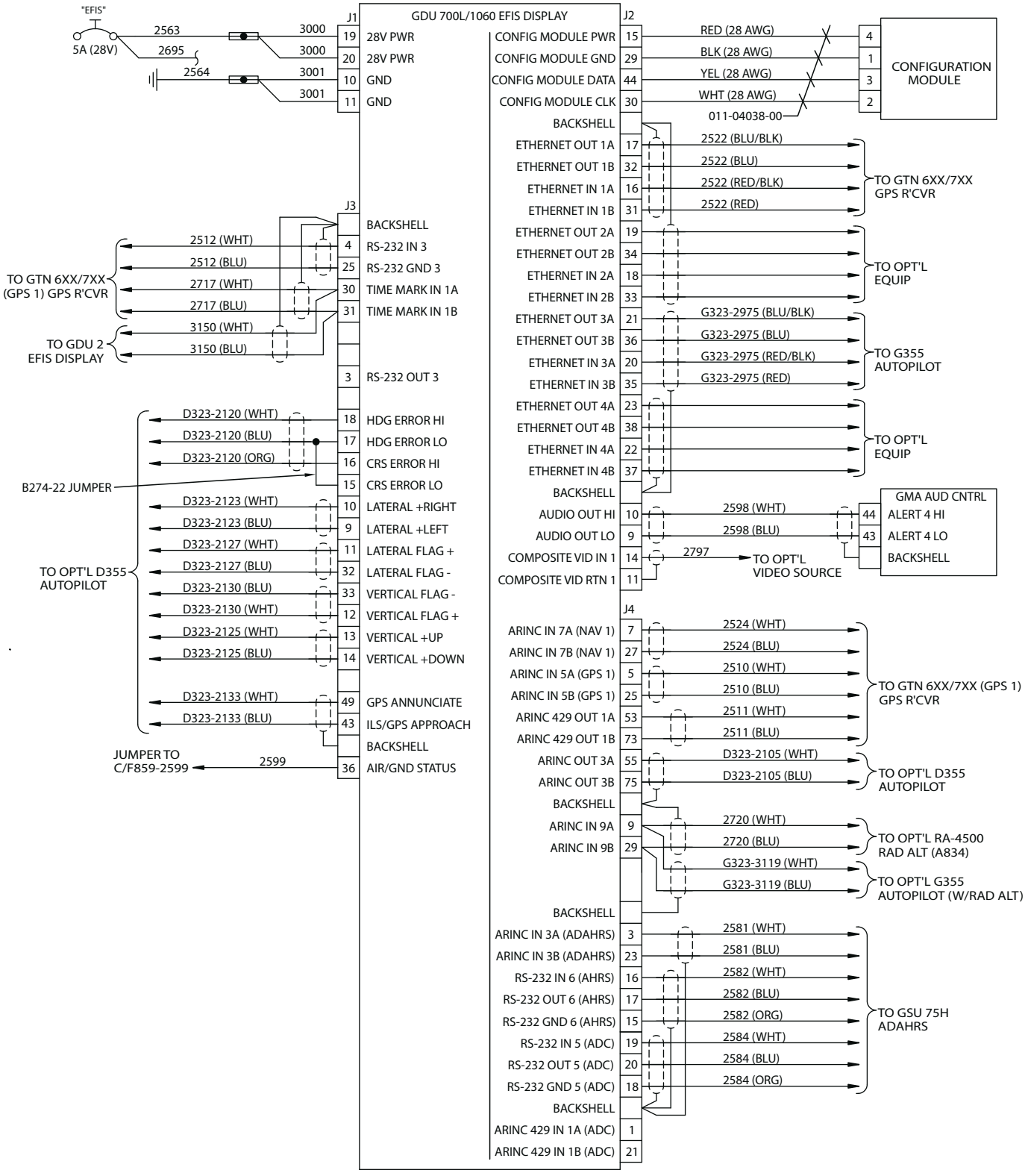
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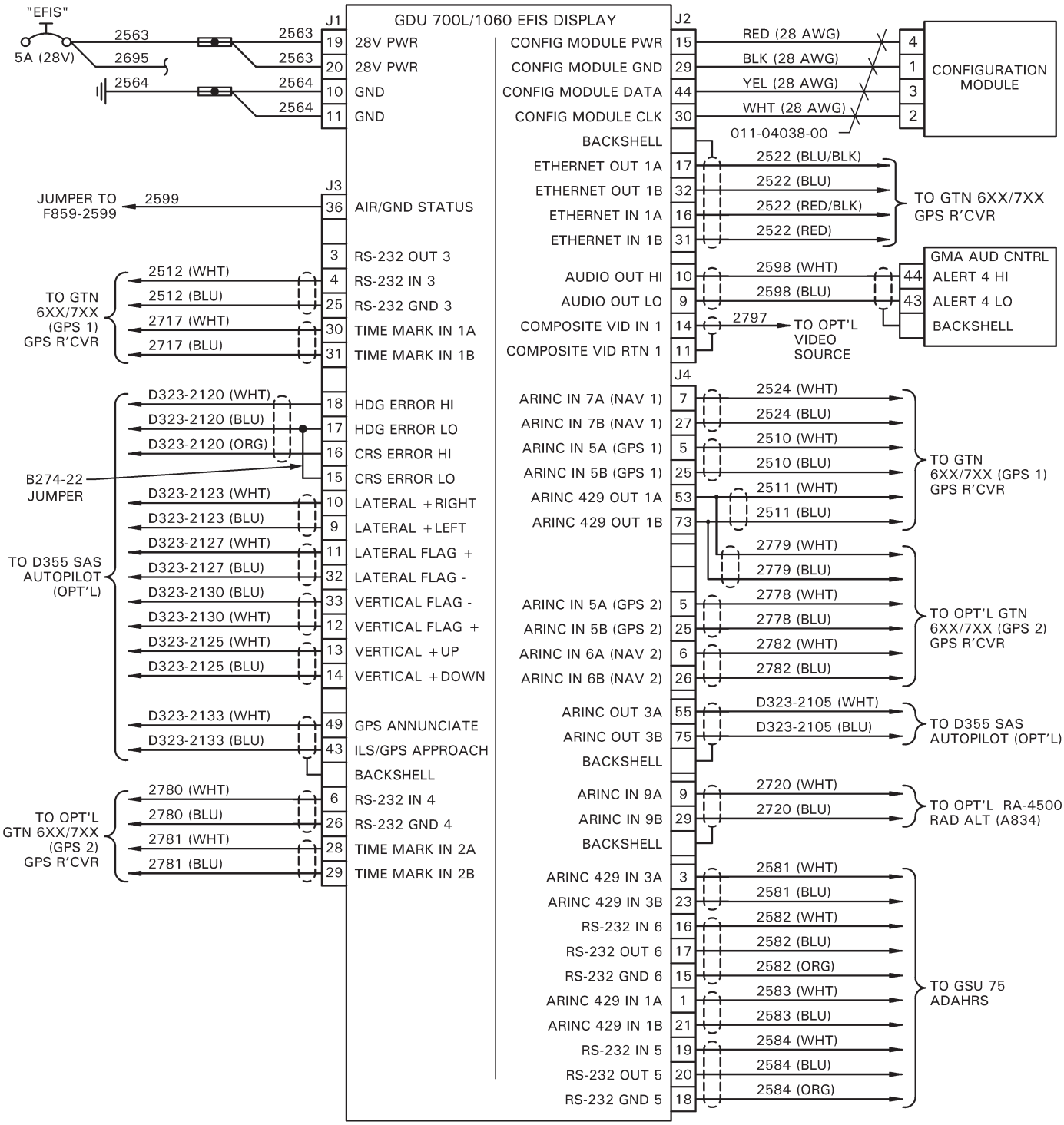
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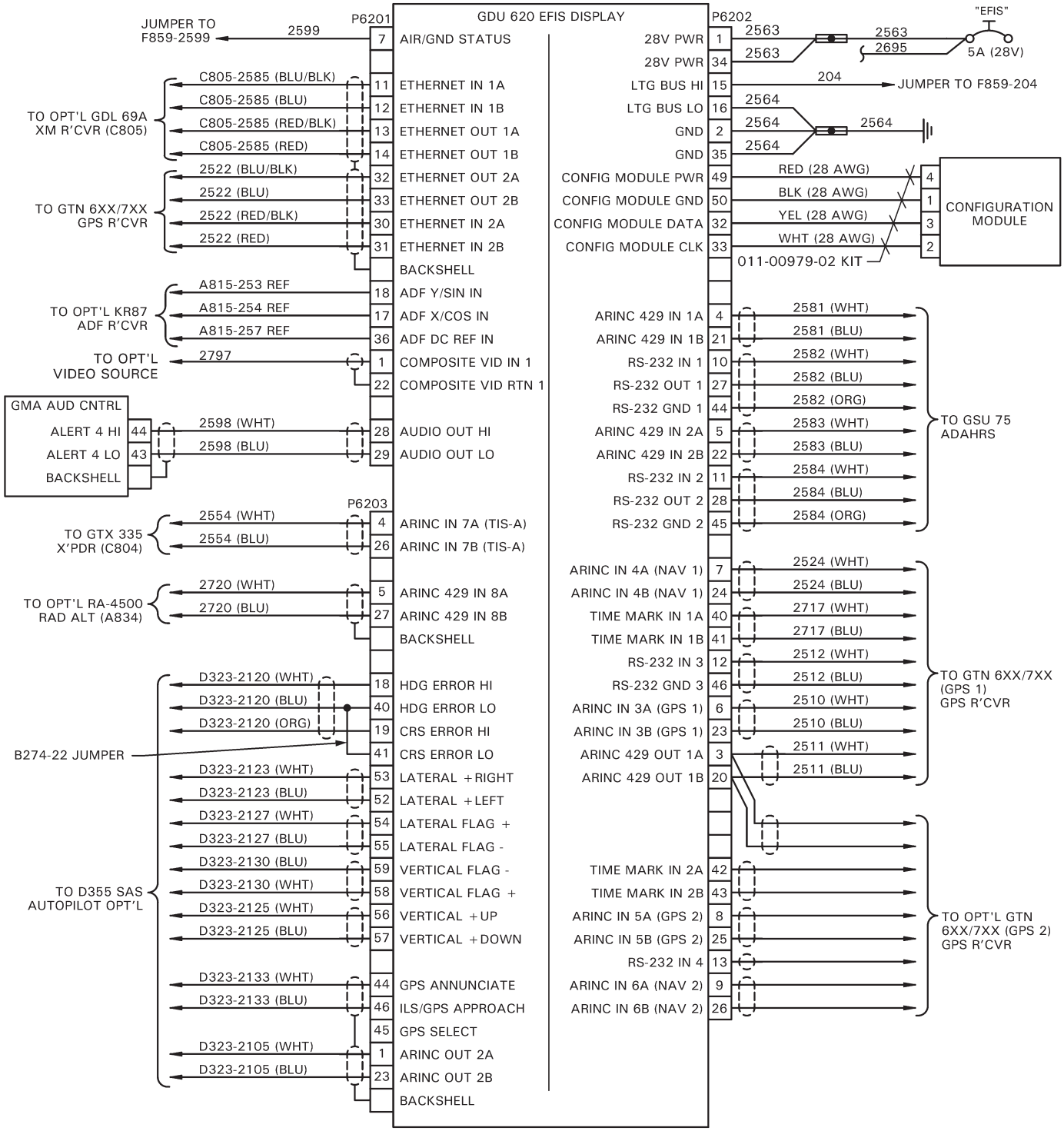
F817 Rev R

FIGURE 98-9 GARMIN GDU 700L or 1060 INSTALLATION (F817 REVISION R)



F817 REV J

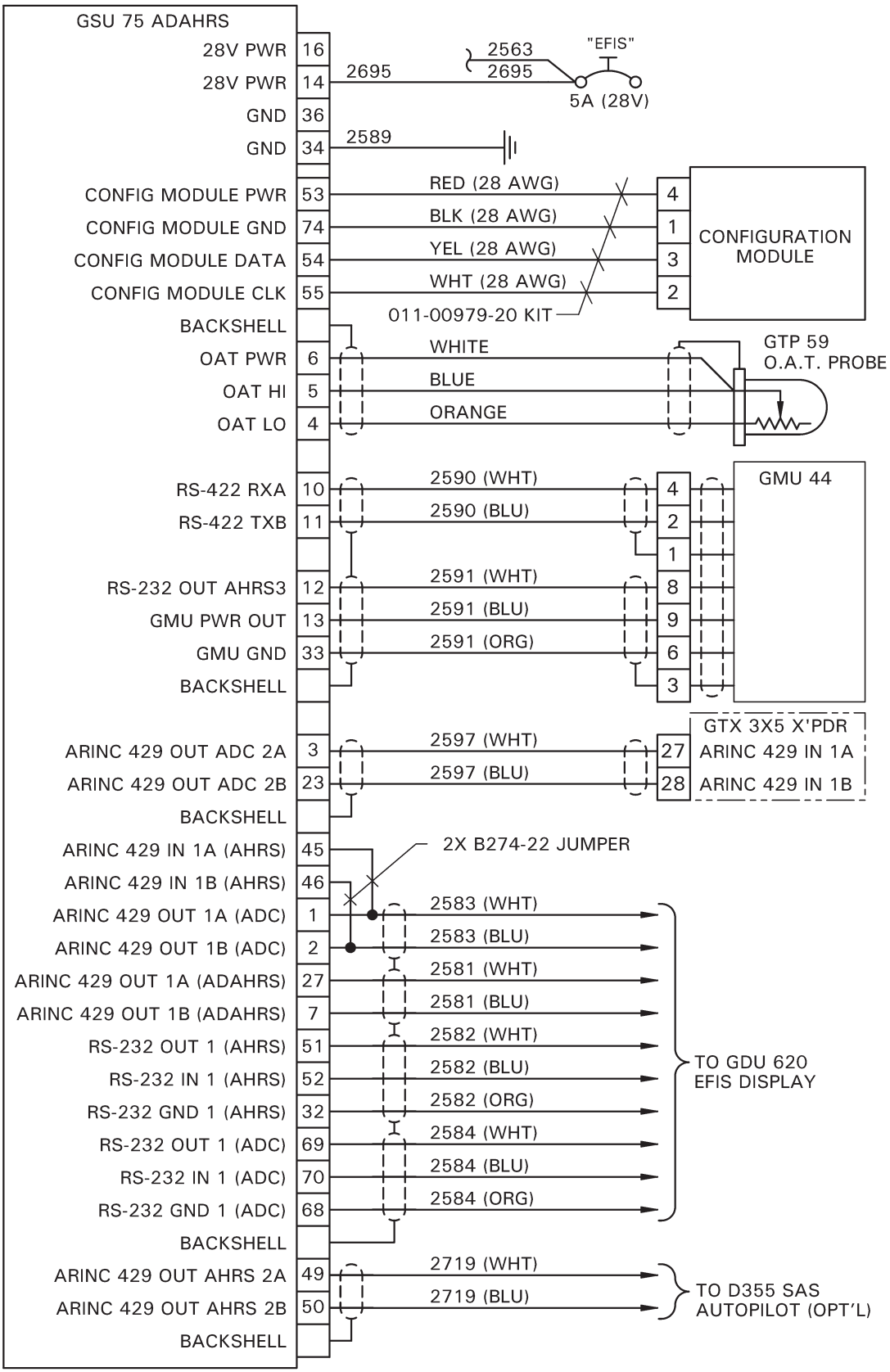
FIGURE 98-9A GARMIN GDU 700L or 1060 INSTALLATION (F817 REVISION J)



F817 REV I

FIGURE 98-9B GARMIN GDU 620 INSTALLATION

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F817 REV I

FIGURE 98-10 GARMIN GSU 75 ADAHRS INSTALLATION

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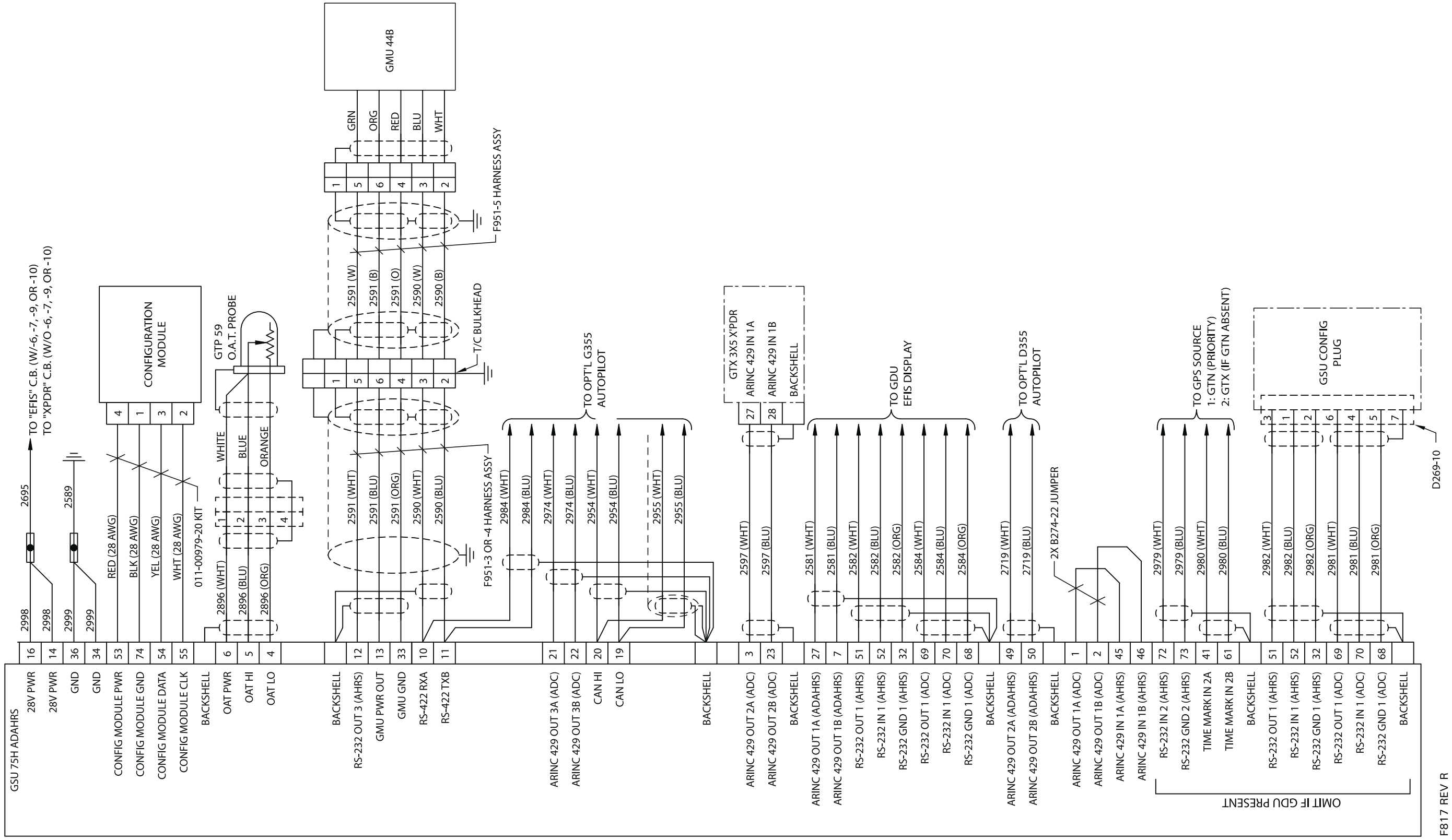


FIGURE 98-10A GARMIN GSU 75H ADAHRS INSTALLATION

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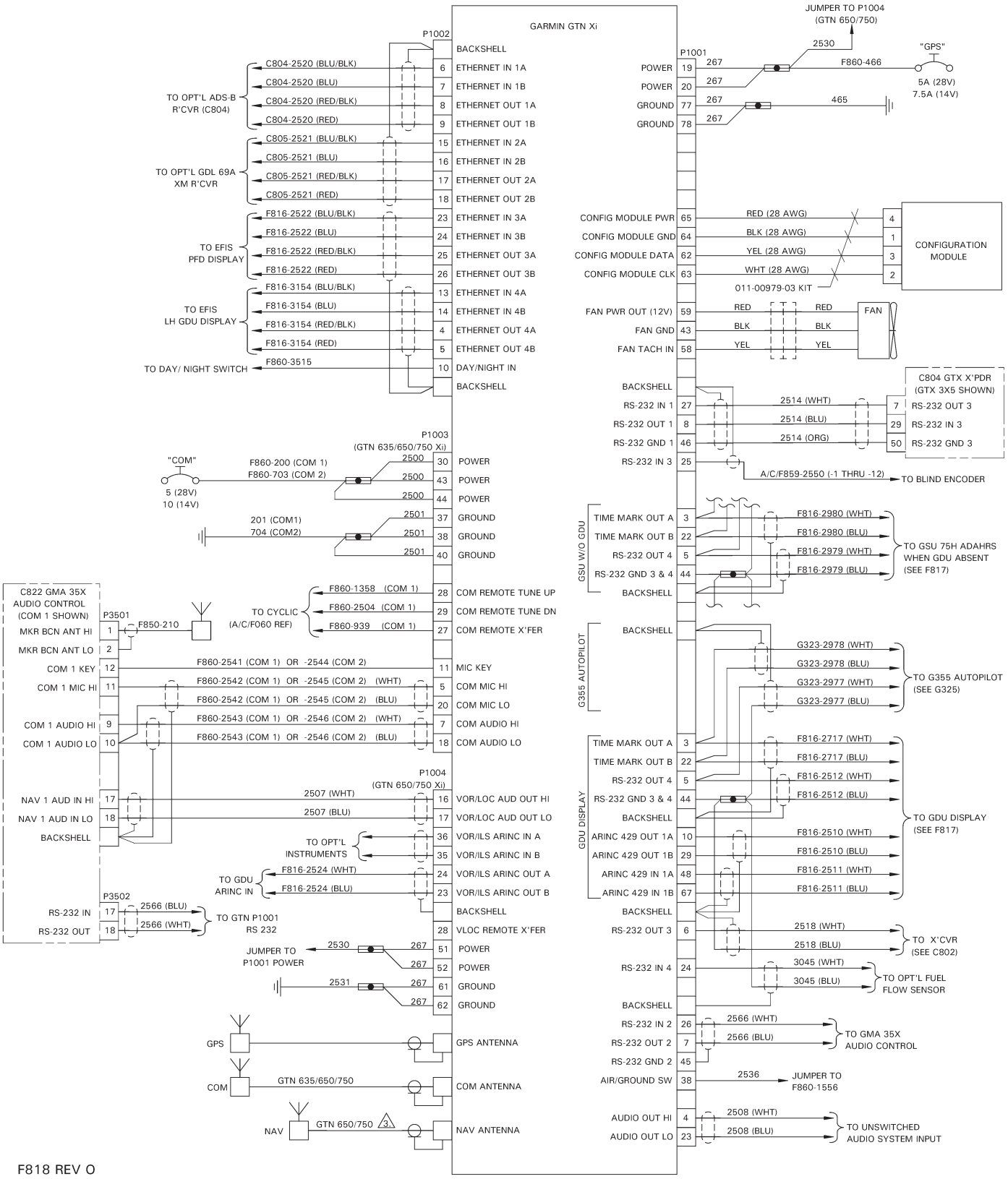


FIGURE 98-12A GARMIN GTN 6XX/7XX-SERIES GPS INSTALLATION (F818 REVISION O)

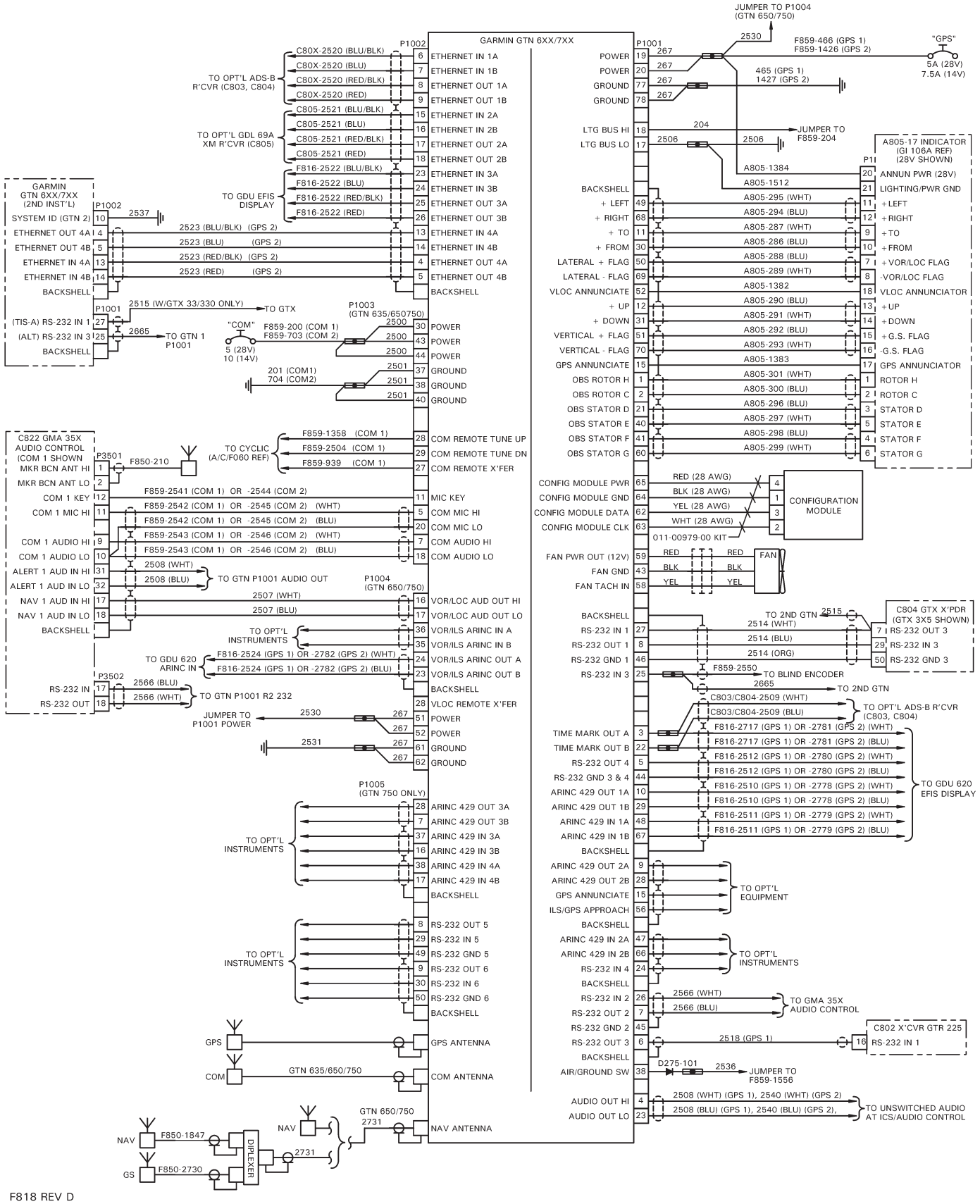
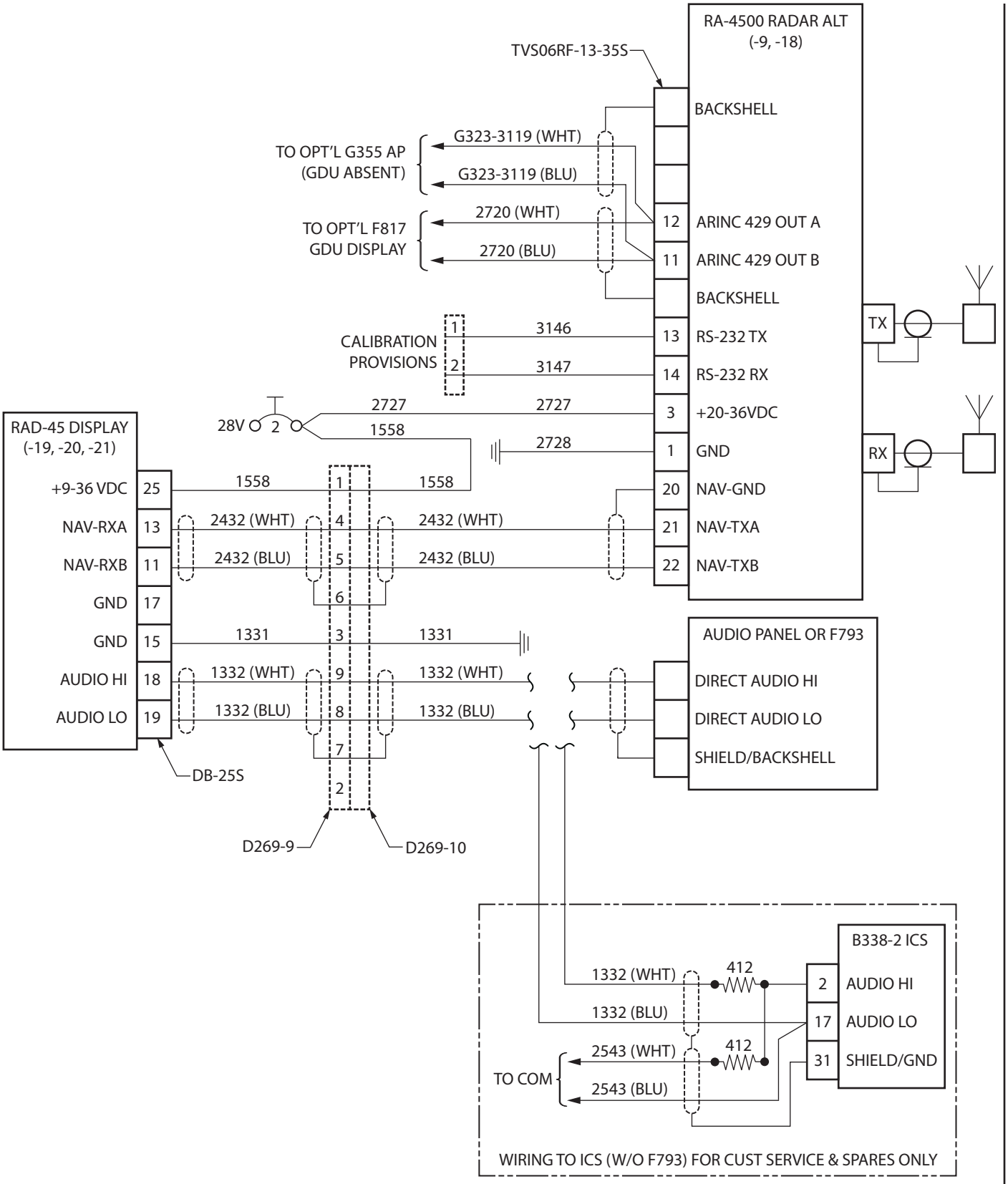
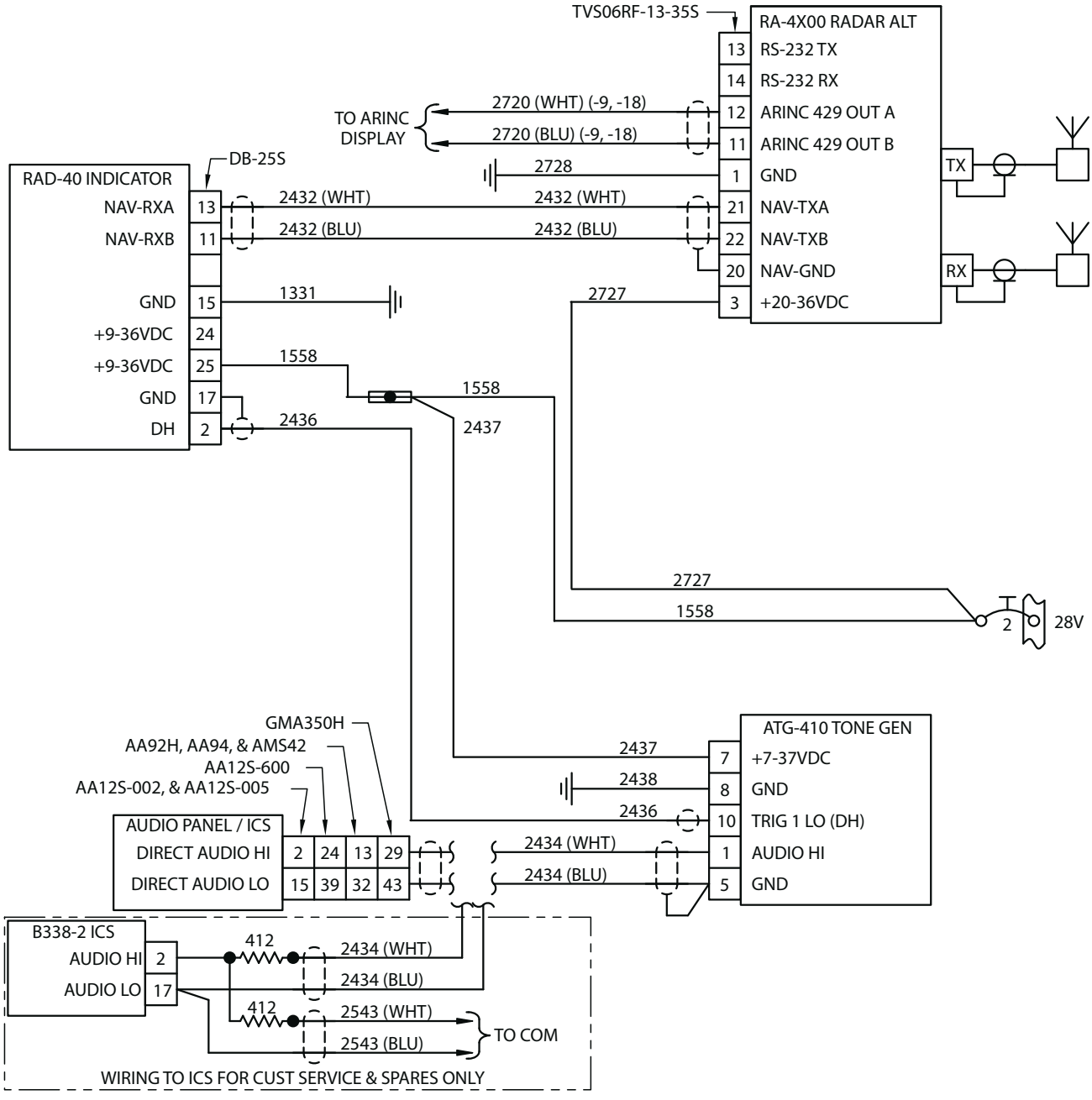


FIGURE 98-13 GARMIN GTN 6XX/7XX-SERIES GPS INSTALLATION (F818 REVISION D)



A834 REV N

FIGURE 98-14 RA-4500 RADAR ALTIMETER INSTALLATION



A834 Rev K

FIGURE 98-14A RA-4000 RADAR ALTIMETER INSTALLATION

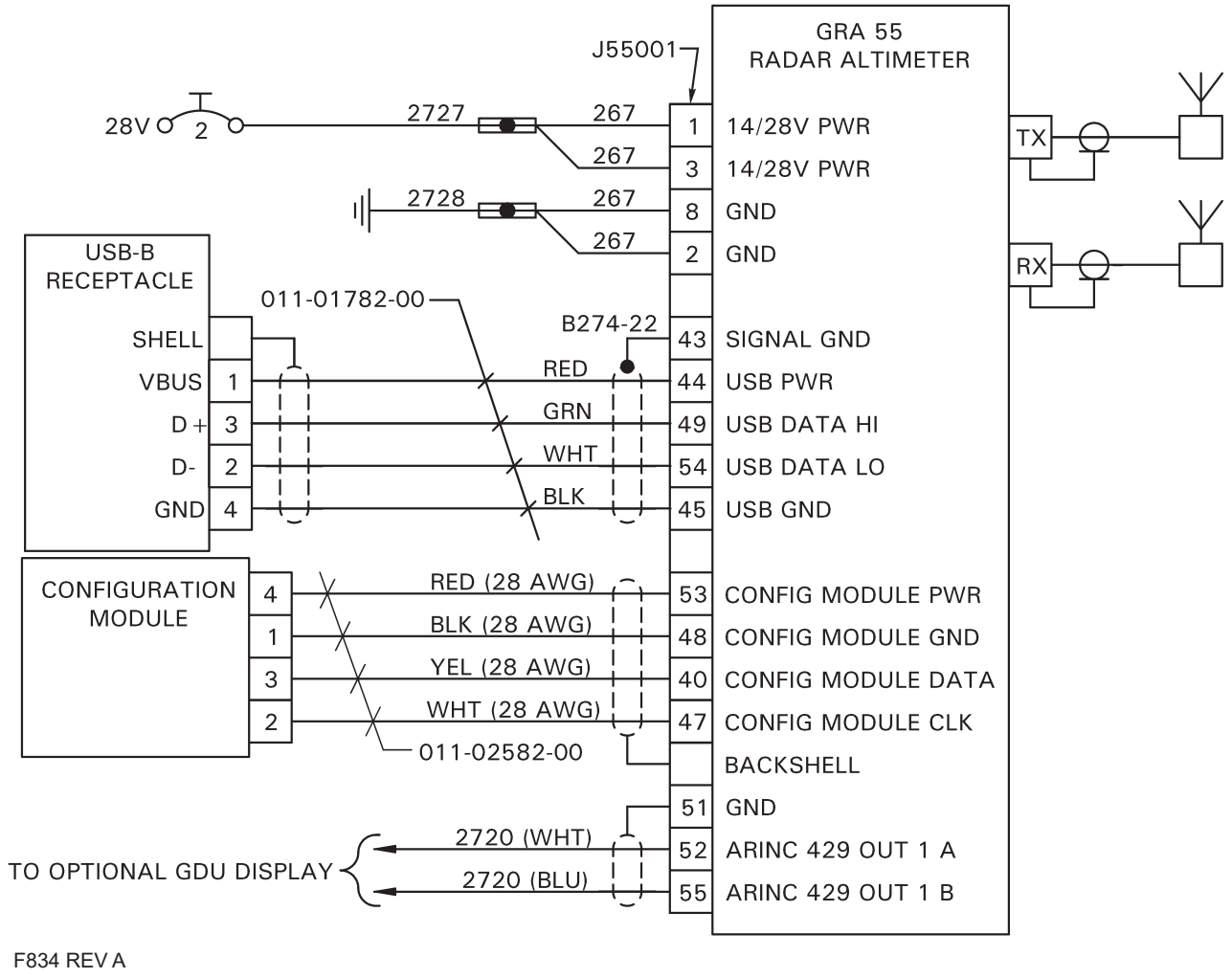


FIGURE 98-14B GRA 55 RADAR ALTIMETER INSTALLATION

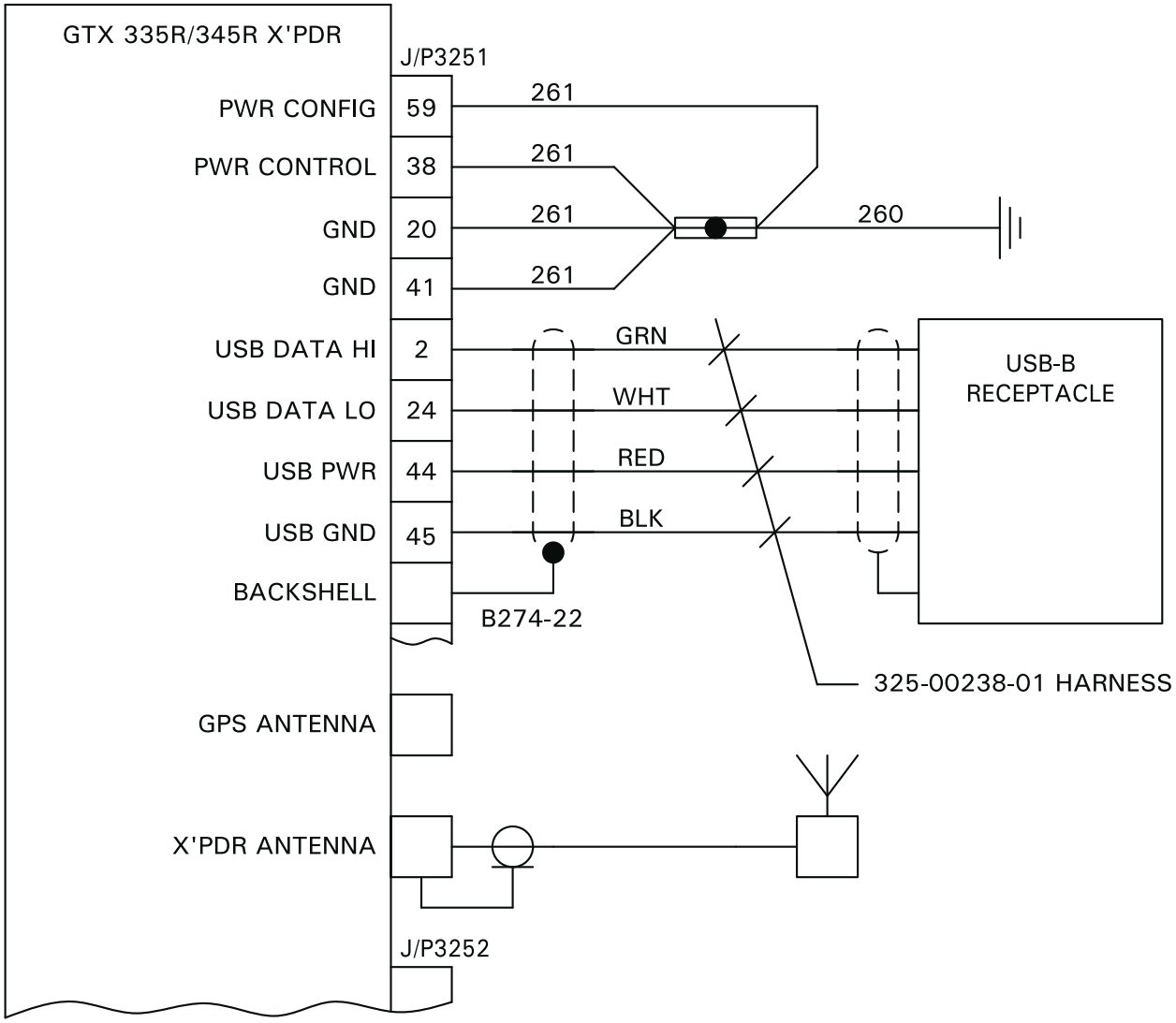
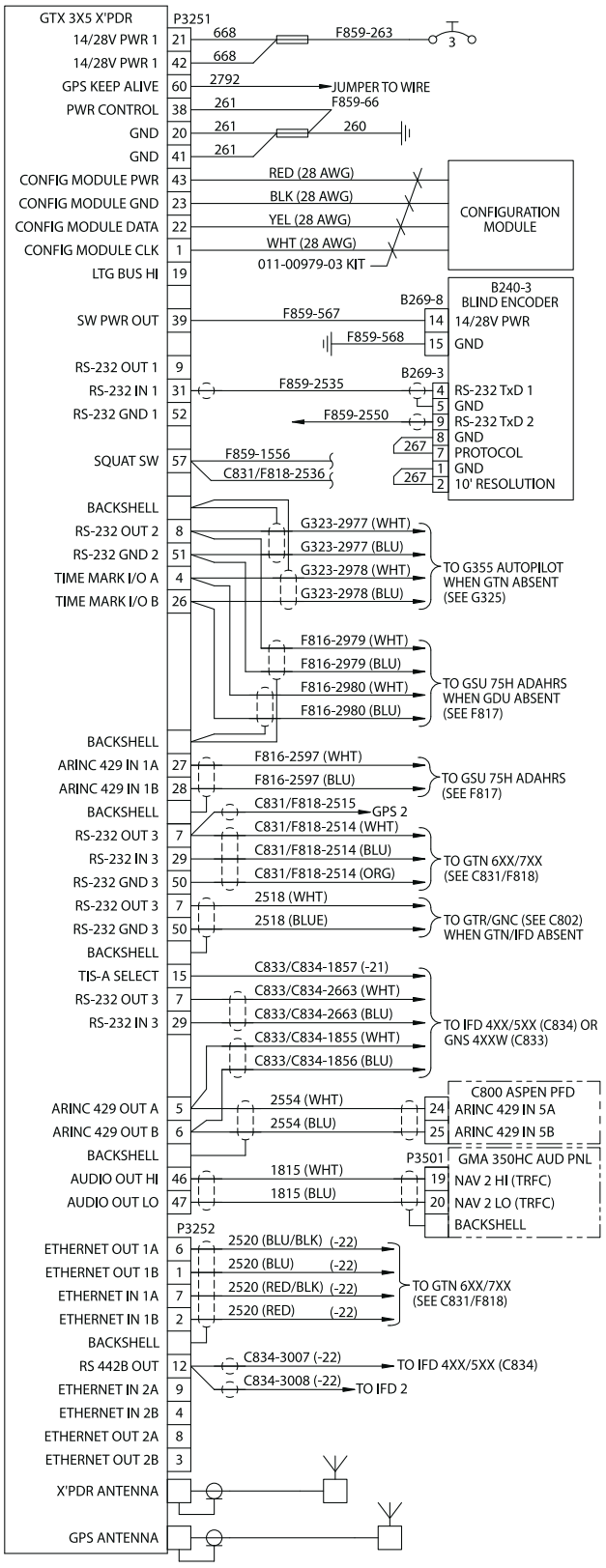
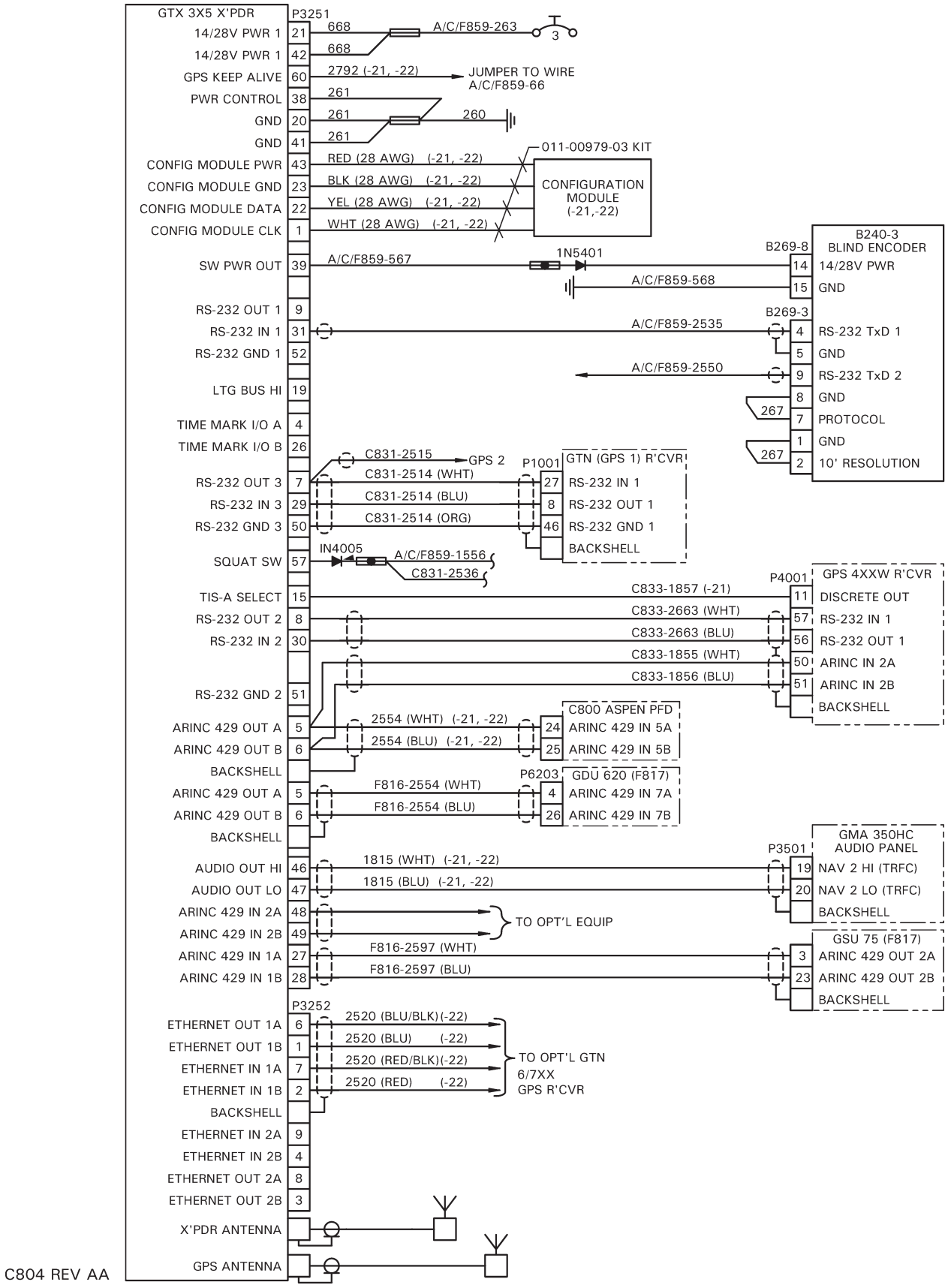


FIGURE 98-15 GARMIN GTX 345R TRANSPONDER INSTALLATION



C804 REV AE

FIGURE 98-15A GARMIN GTX 3X5 TRANSPONDER INSTALLATION (C804 REVISION AE)



C804 REV AA

FIGURE 98-15B GARMIN GTX 3X5 TRANSPONDER INSTALLATION (C804 REVISION AA)

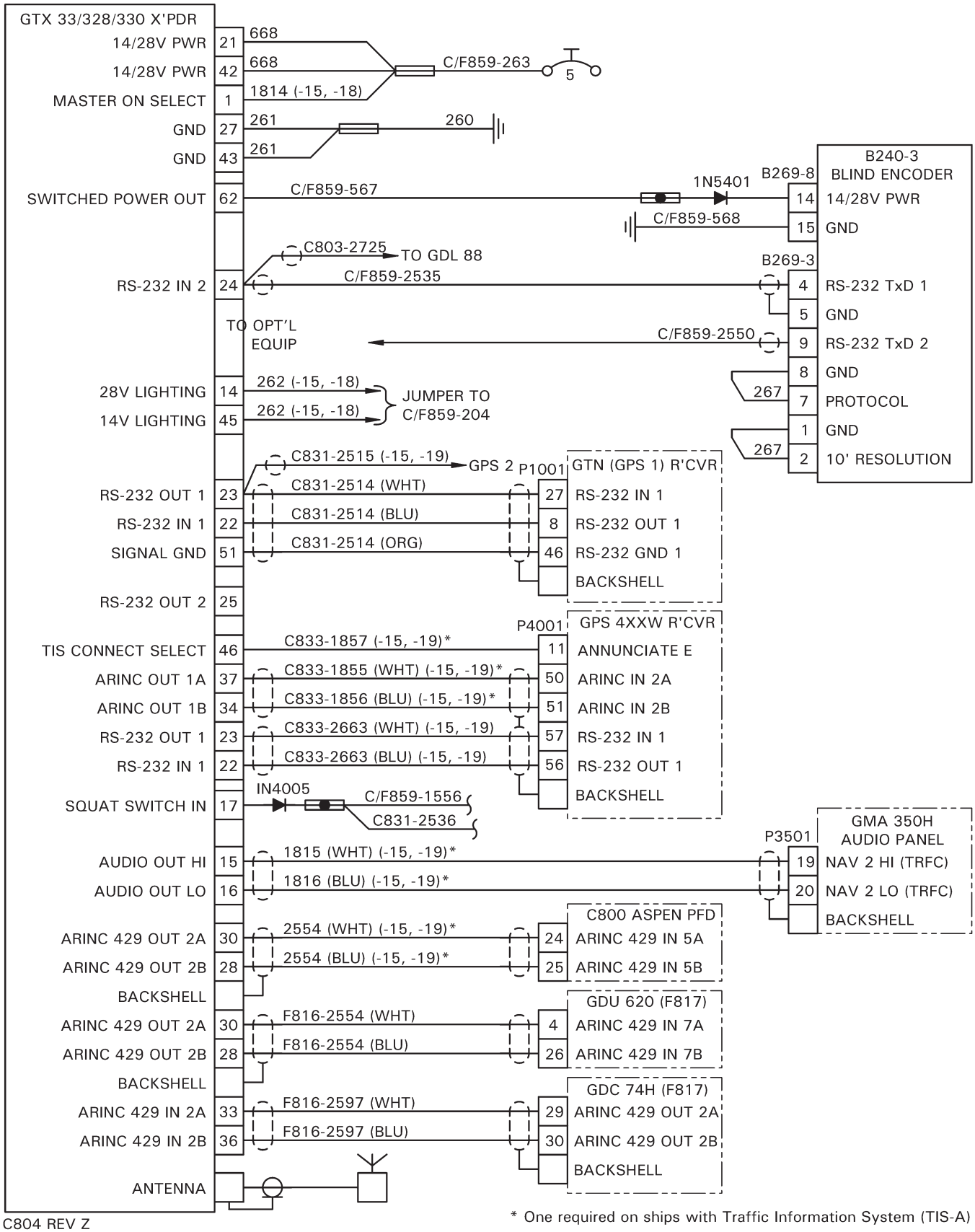
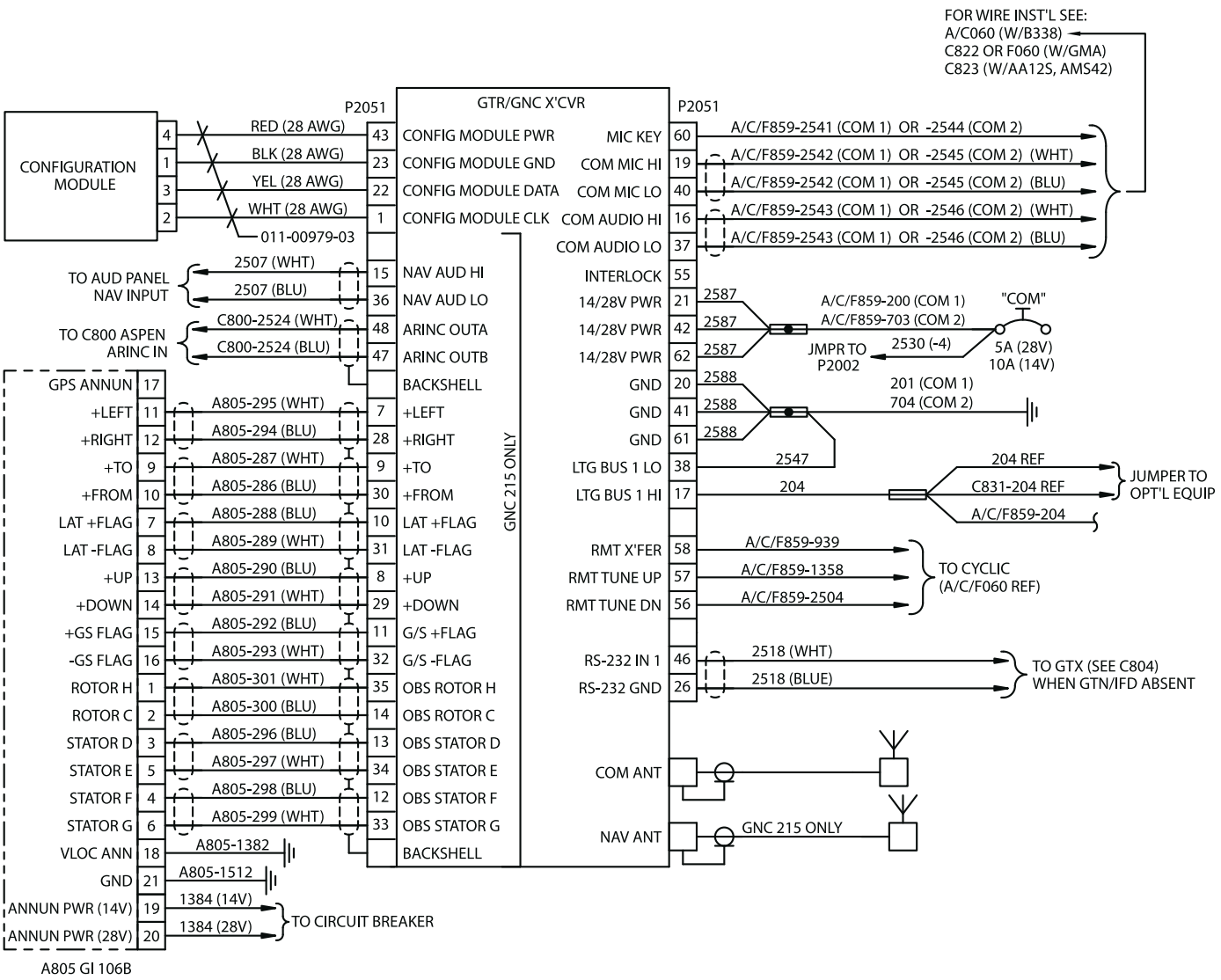


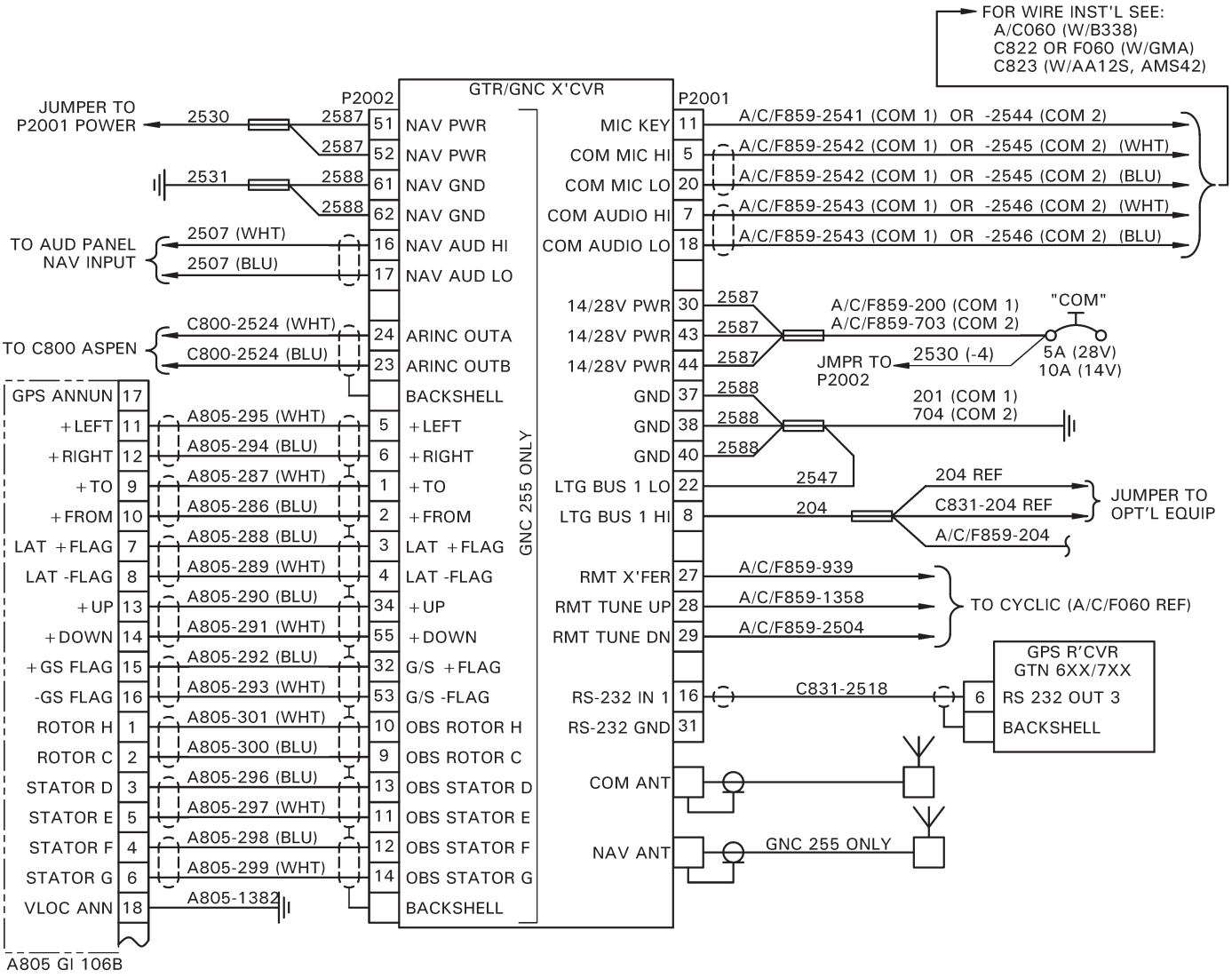
FIGURE 98-16 GARMIN GTX 33/328/330 ES TRANSPONDER INSTALLATION

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C802 -5, -6, -7 REV. G

FIGURE 98-20 GARMIN GTR 205 COM / GNC 215 NAV/COM RADIO INSTALLATION



C802-2, & -4 REV E

FIGURE 98-20A GARMIN GTR 225B COM / GNC 255B NAV/COM RADIO INSTALLATION

REVISION LOG

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18.31	MAY 2015	20.11M	JUL 2020	22.ii	MAR 2026
18.32	MAY 2015	20.11N	JUL 2020	22.1	MAR 2026

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Page	Date	Page	Date	Page	Date
22.2	MAR 2026	22.40	MAR 2026	25.7	APR 2019
22.3	MAR 2026	22.41	MAR 2026	25.8	APR 2019
22.4	MAR 2026	22.42	MAR 2026	25.9	APR 2019
22.5	MAR 2026	22.43	MAR 2026	25.10	APR 2019
22.6	MAR 2026	22.44	MAR 2026	25.11	APR 2019
22.7	MAR 2026	22.45	MAR 2026	25.12	APR 2019
22.8	MAR 2026	22.46	MAR 2026	25.13	MAY 2021
22.9	MAR 2026	22.47	MAR 2026	25.14	MAY 2021
22.10	MAR 2026	22.48	MAR 2026	25.15	APR 2019
22.11	MAR 2026	22.49	MAR 2026	25.16	APR 2019
22.12	MAR 2026	22.50	MAR 2026	25.17	JUL 2023
22.13	MAR 2026	22.51	MAR 2026	25.18	JUL 2023
22.14	MAR 2026	22.52	MAR 2026	25.19	APR 2019
22.15	MAR 2026	22.53	MAR 2026	25.20	APR 2019
22.16	MAR 2026	22.54	MAR 2026	25.21	APR 2019
22.17	MAR 2026	22.55	MAR 2026	25.22	APR 2019
22.18	MAR 2026	22.56	MAR 2026	25.23	APR 2019
22.19	MAR 2026	22.57	MAR 2026	25.24	APR 2019
22.20	MAR 2026	22.58	MAR 2026	25.25	APR 2019
22.21	MAR 2026	22.59	MAR 2026	25.26	APR 2019
22.22	MAR 2026	22.60	MAR 2026	25.27	NOV 2026
22.23	MAR 2026	22.61	MAR 2026	25.28	NOV 2026
22.24	MAR 2026	22.62	MAR 2026	25.29	APR 2019
22.25	NOV 2026	22.63	MAR 2026	25.30	APR 2019
22.26	NOV 2026	22.64	MAR 2026	25.31	NOV 2026
22.27	MAR 2026	22.65	NOV 2026	25.32	NOV 2026
22.28	MAR 2026	22.66	NOV 2026		
22.29	MAR 2026	22.67	MAR 2026	28.i	JUL 2023
22.30	MAR 2026	22.68	MAR 2026	28.ii	JUL 2023
22.31	MAR 2026			28.1	JUL 2023
22.32	MAR 2026	25.i	JUL 2023	28.2	JUL 2023
22.33	MAR 2026	25.ii	JUL 2023	28.3	APR 2017
22.34	MAR 2026	25.1	JUL 2023	28.4	APR 2017
22.35	MAR 2026	25.2	JUL 2023	28.5	JUL 2020
22.36	MAR 2026	25.3	SEP 2012	28.6	JUL 2020
22.37	MAR 2026	25.4	SEP 2012	28.7	JUL 2020
22.38	MAR 2026	25.5	APR 2019	28.8	JUL 2020
22.39	MAR 2026	25.6	APR 2019	28.9	JUL 2020

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28.9A	JUL 2020	28.42	JUL 2023	32.20	JUL 2023
28.9B	JUL 2020			32.21	JUL 2023
28.10	JUL 2020	29.i	MAY 2015	32.22	JUL 2023
28.11	JUL 2020	29.ii	MAY 2015	32.23	SEP 2012
28.11A	JUL 2020	29.1	MAR 2025	32.24	SEP 2012
28.11B	JUL 2020	29.2	MAR 2025		
28.11C	JUL 2020	29.3	MAR 2025	33.i	MAY 2015
28.11D	JUL 2020	29.4	MAR 2025	33.ii	MAY 2015
28.12	JUL 2020	29.5	MAR 2025	33.1	SEP 2023
28.13	APR 2017	29.6	MAR 2025	33.2	SEP 2023
28.14	APR 2017	29.7	JUL 2020	33.3	MAY 2015
28.15	JUL 2020	29.8	JUL 2020	33.4	MAY 2015
28.16	JUL 2020	29.9	JUL 2020		
28.17	JUL 2020	29.10	JUL 2020	52.i	JUL 2023
28.18	JUL 2020			52.ii	JUL 2023
28.19	JUL 2020	32.i	SEP 2012	52.1	JUL 2020
28.20	JUL 2020	32.ii	SEP 2012	52.2	JUL 2020
28.21	JUL 2020	32.1	MAY 2015	52.3	JUL 2020
28.22	JUL 2020	32.2	MAY 2015	52.4	JUL 2020
28.23	APR 2019	32.3	APR 2017	52.5	JUL 2023
28.24	APR 2019	32.3A	APR 2017	52.6	JUL 2023
28.25	JUL 2020	32.3B	APR 2017	52.7	25 OCT 2010
28.26	JUL 2020	32.4	APR 2017	52.8	25 OCT 2010
28.27	JUL 2020	32.5	SEP 2012	52.9	JUL 2020
28.28	JUL 2020	32.6	SEP 2012	52.10	JUL 2020
28.29	MAR 2026	32.7	SEP 2012	52.11	JUL 2023
28.30	MAR 2026	32.8	SEP 2012	52.12	JUL 2023
28.31	MAR 2026	32.9	SEP 2023	52.13	JUL 2023
28.32	MAR 2026	32.10	SEP 2023	52.14	JUL 2023
28.33	JUL 2023	32.11	SEP 2012	52.15	JUL 2023
28.34	JUL 2023	32.12	SEP 2012	52.16	JUL 2023
28.35	JUL 2023	32.13	MAY 2021	52.17	JUL 2023
28.36	JUL 2023	32.14	MAY 2021	52.18	JUL 2023
28.37	JUL 2023	32.15	SEP 2012	52.19	JUL 2023
28.38	JUL 2023	32.16	SEP 2012	52.20	JUL 2023
28.39	JUL 2023	32.17	SEP 2012	52.21	JUL 2023
28.40	JUL 2023	32.18	SEP 2012	52.22	JUL 2023
28.41	JUL 2023	32.19	JUL 2023		

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Page	Date
53.i	NOV 2023
53.ii	NOV 2023
53.1	NOV 2026
53.2	NOV 2026
53.3	NOV 2026
53.4	NOV 2026
53.5	JUL 2020
53.6	JUL 2020
53.7	JUL 2020
53.8	JUL 2020
53.9	25 OCT 2010
53.10	25 OCT 2010
53.11	MAY 2015
53.12	MAY 2015
53.13	MAR 2025
53.14	MAR 2025
53.15	NOV 2023
53.16	NOV 2023
53.17	NOV 2023
53.18	NOV 2023
53.19	MAR 2025
53.20	MAR 2025
53.21	MAR 2025
53.22	MAR 2025
53.23	NOV 2023
53.24	NOV 2023
53.25	MAR 2025
53.26	MAR 2025
53.27	NOV 2023
53.28	NOV 2023
53.29	NOV 2023
53.30	NOV 2023
62.i	MAR 2025
62.ii	MAR 2025
62.1	JUL 2023
62.2	JUL 2023
62.3	JUL 2023
62.4	JUL 2023
62.5	JUL 2023
62.6	JUL 2023
62.7	JUL 2023
62.8	JUL 2023
62.9	JUL 2023
62.10	JUL 2023
62.10A	JUL 2023
62.10B	JUL 2023
62.11	JUL 2023
62.12	JUL 2023
62.13	JUL 2023
62.14	JUL 2023
62.15	JUL 2023
62.16	JUL 2023
62.17	JUL 2023
62.17A	JUL 2023
62.17B	JUL 2023
62.17C	JUL 2023
62.17D	JUL 2020
62.18	JUL 2020
62.19	JUL 2020
62.20	JUL 2020
62.21	APR 2019
62.21A	APR 2019
62.21B	APR 2019
62.22	APR 2019
62.23	APR 2019
62.24	APR 2019
62.25	MAY 2021
62.26	MAY 2021
62.27	MAR 2025
62.28	MAR 2025
62.29	MAR 2025
62.30	MAR 2025
62.31	MAR 2025
62.32	MAR 2025
63.i	APR 2017
63.ii	APR 2017
63.1	APR 2017
63.2	APR 2017
63.3	JUL 2020
63.4	JUL 2020
63.5	JUL 2023
63.6	JUL 2023
63.7	APR 2017
63.8	APR 2017
63.9	MAR 2025
63.10	MAR 2025
63.11	APR 2017
63.12	APR 2017
63.13	APR 2017
63.14	APR 2017
64.i	JUL 2023
64.ii	JUL 2023
64.1	MAR 2025
64.2	MAR 2025
64.3	MAR 2025
64.4	MAR 2025
64.5	JUL 2023
64.6	JUL 2023
64.7	JUL 2023
64.8	JUL 2023
64.9	JUL 2023
64.10	JUL 2023
64.11	JUL 2023
64.12	JUL 2023
64.13	JUL 2023
64.14	JUL 2023
64.15	JUL 2023
64.16	JUL 2023
64.17	JUL 2023
64.18	JUL 2023
64.19	JUL 2023

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Page	Date
64.20	JUL 2023
64.21	JUL 2023
64.22	JUL 2023
65.i	SEP 2012
65.ii	SEP 2012
65.1	MAY 2015
65.2	MAY 2015
65.3	SEP 2023
65.4	SEP 2023
65.5	MAY 2015
65.6	MAY 2015
65.7	MAY 2015
65.8	MAY 2015
65.9	MAY 2015
65.10	MAY 2015
65.11	SEP 2012
65.12	SEP 2012
67.i	MAY 2015
67.ii	MAY 2015
67.1	MAR 2012
67.2	MAR 2012
67.3	25 OCT 2010
67.4	25 OCT 2010
67.5	MAR 2026
67.6	MAR 2026
67.7	MAR 2026
67.8	MAR 2026
67.9	APR 2017
67.10	APR 2017
67.11	MAY 2015
67.12	MAY 2015
67.13	JUL 2020
67.14	JUL 2020
67.15	MAY 2015
67.16	MAY 2015
67.17	NOV 2023
67.18	NOV 2023
71.i	JUL 2020
71.ii	JUL 2020
71.1	JUL 2020
71.2	JUL 2020
71.3	JUL 2020
71.3A	JUL 2020
71.3B	JUL 2020
71.4	JUL 2020
71.5	JUL 2020
71.6	JUL 2020
71.7	JUL 2023
71.7A	JUL 2023
71.7B	JUL 2023
71.8	JUL 2023
71.9	JUL 2020
71.10	JUL 2020
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71.13	APR 2017
71.14	APR 2017
71.15	APR 2019
71.16	APR 2019
71.17	JUL 2020
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76.7	25 OCT 2010
76.8	25 OCT 2010
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79.ii	APR 2017
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79.2	APR 2019
79.3	APR 2017
79.4	APR 2017
79.5	APR 2017
79.6	APR 2017
79.7	APR 2017
79.8	APR 2017
90.i	JUL 2020
90.ii	JUL 2020
90.1	SEP 2023
90.2	SEP 2023
90.3	JUL 2020
90.4	JUL 2020
90.5	NOV 2026
90.6	NOV 2026
90.7	JUL 2020
90.8	JUL 2020
90.9	JUL 2020
90.10	JUL 2020
90.11	JUL 2020
90.12	JUL 2020
90.13	NOV 2026
90.14	NOV 2026
90.15	JUL 2020
90.16	JUL 2020

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90.17	JUL 2020	90.55	JUL 2020	92.31A	JUL 2020
90.18	JUL 2020	90.56	JUL 2020	92.31B	JUL 2020
90.19	JUL 2020	90.57	JUL 2020	92.32	JUL 2020
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90.22	JUL 2020	92.i	JUL 2020	92.35	JUL 2020
90.23	JUL 2020	92.ii	JUL 2020	92.36	JUL 2020
90.24	JUL 2020	92.1	SEP 2023	92.37	JUL 2020
90.25	JUL 2020	92.2	SEP 2023	92.38	JUL 2020
90.26	JUL 2020	92.3	NOV 2026	92.39	JUL 2020
90.27	JUL 2020	92.4	NOV 2026	92.40	JUL 2020
90.28	JUL 2020	92.5	JUL 2020	92.41	JUL 2020
90.29	JUL 2020	92.6	JUL 2020	92.42	JUL 2020
90.30	JUL 2020	92.7	JUL 2020	92.43	JUL 2020
90.31	JUL 2020	92.8	JUL 2020	92.44	JUL 2020
90.32	JUL 2020	92.9	JUL 2020	92.45	JUL 2020
90.33	JUL 2020	92.10	JUL 2020	92.46	JUL 2020
90.34	JUL 2020	92.11	NOV 2026	92.47	JUL 2020
90.35	JUL 2020	92.12	NOV 2026	92.48	JUL 2020
90.36	JUL 2020	92.13	JUL 2020	92.49	JUL 2020
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90.38	JUL 2020	92.15	JUL 2020	92.51	JUL 2020
90.39	JUL 2020	92.16	JUL 2020	92.52	JUL 2020
90.40	JUL 2020	92.17	JUL 2020	92.53	JUL 2020
90.41	JUL 2020	92.18	JUL 2020	92.54	JUL 2020
90.42	JUL 2020	92.19	JUL 2020	92.55	JUL 2020
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90.44	JUL 2020	92.21	JUL 2020	92.57	JUL 2020
90.45	JUL 2020	92.22	JUL 2020	92.58	JUL 2020
90.46	JUL 2020	92.23	JUL 2020	92.59	JUL 2020
90.47	JUL 2020	92.24	JUL 2020	92.60	JUL 2020
90.48	JUL 2020	92.25	JUL 2020	92.61	JUL 2020
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90.51	JUL 2020	92.28	JUL 2020	92.64	JUL 2020
90.52	JUL 2020	92.29	JUL 2020	92.65	JUL 2020
90.53	JUL 2020	92.30	JUL 2020	92.66	JUL 2020
90.54	JUL 2020	92.31	JUL 2020	92.67	JUL 2020

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92.68	JUL 2020			97.11	NOV 2026
		96.i	JUL 2023	97.12	NOV 2026
95.i	NOV 2026	96.ii	JUL 2023	97.13	NOV 2026
95.ii	NOV 2026	96.1	APR 2019	97.14	NOV 2026
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95.2	NOV 2026	96.3	APR 2019	97.16	NOV 2026
95.3	NOV 2026	96.4	APR 2019	97.17	NOV 2026
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95.5	NOV 2026	96.4B	JUL 2023	97.19	NOV 2026
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95.11	NOV 2026	96.10	APR 2017	97.25	NOV 2026
95.12	NOV 2026	96.11	APR 2017	97.26	NOV 2026
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95.16	NOV 2026	96.15	APR 2017	97.30	NOV 2026
95.17	NOV 2026	96.16	APR 2017	97.31	NOV 2026
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95.21	NOV 2026	96.20	MAR 2025	97.35	NOV 2026
95.22	NOV 2026			97.36	NOV 2026
95.23	NOV 2026	97.i	NOV 2026	97.37	NOV 2026
95.24	NOV 2026	97.ii	NOV 2026	97.38	NOV 2026
95.25	NOV 2026	97.1	NOV 2026	97.39	NOV 2026
95.26	NOV 2026	97.2	NOV 2026	97.40	NOV 2026
95.27	NOV 2026	97.3	NOV 2026	97.41	NOV 2026
95.28	NOV 2026	97.4	NOV 2026	97.42	NOV 2026
95.29	NOV 2026	97.5	NOV 2026	97.43	NOV 2026
95.30	NOV 2026	97.6	NOV 2026	97.44	NOV 2026
95.31	NOV 2026	97.7	NOV 2026	97.45	NOV 2026
95.32	NOV 2026	97.8	NOV 2026	97.46	NOV 2026
95.33	NOV 2026	97.9	NOV 2026	97.47	NOV 2026
95.34	NOV 2026	97.10	NOV 2026	97.48	NOV 2026

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Page	Date	Page	Date	Page	Date
97.49	NOV 2026	98.20	APR 2017	98.50	APR 2019
97.50	NOV 2026	98.21	APR 2017	98.51	APR 2019
97.51	NOV 2026	98.22	APR 2017	98.52	APR 2019
97.52	NOV 2026	98.23	NOV 2026	98.53	APR 2019
97.53	NOV 2026	98.24	NOV 2026	98.54	APR 2019
97.54	NOV 2026	98.24A	JUL 2020	98.55	APR 2019
97.55	NOV 2026	98.24B	JUL 2020	98.56	APR 2019
97.56	NOV 2026	98.24C	JUL 2020	98.57	APR 2019
		98.24D	JUL 2020	98.58	APR 2019
98.i	NOV 2026	98.25	NOV 2026	98.59	APR 2019
98.ii	NOV 2026	98.25A	NOV 2026	98.60	APR 2019
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98.2	JUL 2023	98.26	NOV 2026	98.62	JUL 2020
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98.2B	JUL 2020	98.28	NOV 2026	98.64	MAR 2026
98.3	APR 2017	98.29	NOV 2026		
98.4	APR 2017	98.30	APR 2017	99.i	APR 2017
98.5	APR 2017	98.31	APR 2017	99.ii	APR 2017
98.6	APR 2017	98.32	APR 2017	99.1	MAR 2026
98.7	APR 2017	98.33	APR 2017	99.2	MAR 2026
98.8	APR 2017	98.34	APR 2017	99.3	JUL 2023
98.9	APR 2017	98.35	APR 2017	99.4	JUL 2023
98.10	APR 2017	98.36	APR 2017	99.5	MAR 2025
98.11	APR 2017	98.37	NOV 2026	99.6	MAR 2025
98.12	APR 2017	98.38	NOV 2026	99.7	JUL 2023
98.13	MAR 2026	98.39	APR 2017	99.8	JUL 2023
98.13A	MAR 2026	98.40	APR 2017	99.9	JUL 2023
98.13B	MAR 2026	98.41	APR 2017	99.10	JUL 2023
98.14	MAR 2026	98.42	APR 2017		
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98.15B	NOV 2026	98.45	JUL 2020	100.1	NOV 2026
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98.17	APR 2017	98.45B	JUL 2020	100.3	NOV 2026
98.17A	NOV 2026	98.46	JUL 2020	100.4	NOV 2026
98.17B	NOV 2026	98.47	JUL 2023	100.5	NOV 2026
98.18	NOV 2026	98.48	JUL 2023	100.6	NOV 2026
98.19	APR 2017	98.49	APR 2019	100.7	NOV 2026

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100.8	NOV 2026
100.9	NOV 2026
100.10	NOV 2026
100.11	NOV 2026
100.12	NOV 2026

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