R44 MAINTENANCE MANUAL
and
INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
RTR 460 VOLUME I

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1.102 Additional Component Maintenance (continued)

A. 12 YEARS (continued)

Part Number	Description	Action
C174-1 Revision G or subsequent	Support (engine mount at prop governor pad; vertical tube lower portion is 0.562 inch dia.)	Remove rod ends and visually inspect, including tube interiors. Replace if corrosion is evident.
C174-7	Support Weldment	Remove rod ends and visually inspect, including tube interiors. Replace if corrosion is evident. Coat tube interiors with B270-21 protectant.
C258-1	Main Rotor Pitch Link Assembly	Replace with new C258-8 link assembly.
C258-5 or -8	Main Rotor Pitch Link Assembly	Perform inspection per § 2.630, or replace with new C258-8 link assembly.
C315-9	Support Weldment – Lower Aft Flight Controls	Visually inspect. If exterior corrosion is evident, remove and inspect tube interior. Repair or replace as required.
C319-5	Torque Tube – Cyclic	Visually inspect. If exterior corrosion is evident, remove and inspect tube interior. Repair or replace as required.
C334-4	Bellcrank Assembly (Collective)	Visually inspect. If exterior corrosion is evident, remove and inspect tube interior. Repair or replace as required. Verify bearings rotate smoothly without noise.
C336-1	Push-Pull Tube Assembly, Throttle (R44)	Visually inspect. If exterior corrosion is evident, record length, disassemble, and inspect tube interior. Repair or replace as required.
C339-1 or -10	Jackshaft Weldment	Visually inspect. Repair or replace as required.
C343-1*, -9, & -11 (*R44 SL-43 refers)	Push-Pull Tube Assembly – Tail Rotor	Visually inspect. If exterior corrosion is evident, record length, disassemble, and inspect tube interior. Repair or replace as required.
C343-8	Tube – Aft Servo	Visually inspect. If exterior corrosion is evident, record length, disassemble, and inspect tube interior. Repair or replace as required.
C348-1	Anchor Assembly – Collective Stop	Visually inspect. If exterior corrosion is evident, remove and inspect tube interior. Repair or replace as required.
C348-5	Anchor Assembly – Seat Belt (Forward)	Replace if seat buckle attaching lugs are less than 0.073 inch thick. Visually inspect. If exterior corrosion is evident, remove and inspect tube interior. Repair or replace as required.
C480-1	Swashplate Boot	Replace with new.
C608-1	Support Weldment – Throttle Bellcrank	Visually inspect. If exterior corrosion is evident, remove and inspect tube interior. Repair or replace as required.
C649-1	Oil Cooler	Replace with new or overhauled C649-2 oil cooler.
C649-2 & -3	Oil Cooler	Flush & 400-psi pressure test or overhaul or replace with new.

1.102 Additional Component Maintenance (continued)

A. 12 YEARS (continued)

Part Number	Description	Action
C792-4 or -5	Dual Tachometer	Submit to RHC Repair Station for 12-year service, or replace with new or overhaul exchange.
C907-1 or -2 Revision A thru G (weldment)	Yoke – Clutch Shaft Forward (1.43-inch dia. center hole between arms)	Replace with C907-1 or -2 Revision H or subsequent yoke.
C907-1 or -2 Revision H or subsequent (forging)	Yoke – Clutch Shaft Forward (1.471-inch dia. bore)	Replace with new, or comply with FAA AD 2025-11-07 (see current revision of R44 Service Letter SL-91).
C918-15	Elastic Cord – Collective	Replace with new A918-20 cord.
C947-1 & -3	Flex Plate Assembly (bonded)	Visually inspect with 10x magnification. Replace if corrosion is evident. Replace if any bonded washer evidences separation (8 places).
D046-1 or -2 (LH), & D046-3 (RH)	Strut Weldments	Visually inspect for corrosion; replace if pitted. If non-pitting, surface corrosion is found, remove corrosion & paint per § 23-71 and MPI per § 23-41. Powder coat per § 23-76 (preferred), or prime & paint per §§ 23-75 & 23-77.
D151-2	Stop (teeter, 2 each)	Replace with new.
D174-2	Fanwheel	Perform 12-year service per § 2.620, or replace with new or overhaul exchange.
D201-5	Support Assembly – Hydraulic Servos (fwd)	Replace D201-5 with D201-6 support assembly.
D203-1	Support Assembly – LH (aft servo)	Visually inspect. If exterior corrosion is evident, record length, disassemble, and inspect tube interior. Repair or replace as required.
D204-8	Support Assembly – RH (aft servo)	Visually inspect. If exterior corrosion is evident, record length, disassemble, and inspect tube interior. Repair or replace as required.
D207-1	Strut Weldment – Jackshaft, Forward	Visually inspect. If exterior corrosion is evident, record length, disassemble, and inspect tube interior. Repair or replace as required.
D208-1	Strut Weldment – Jackshaft, Aft	Visually inspect. If exterior corrosion is evident, record length, disassemble, and inspect tube interior. Repair or replace as required.
D211-1 or -2	Hydraulic Reservoir	Perform 12-year service per § 2.660, or replace with new or overhaul exchange.
D212-1	Hydraulic Servo Actuators	Remove upper clevis, scissor, and D200-3 washer from servo, as applicable. Visually inspect threaded bore in piston shaft with borescope. Replace servo if corrosion is evident.
D224-1 or -2	Tail Rotor Drive Shaft	Remove yoke(s) and inspect shaft interior using borescope. Replace shaft if corrosion is evident.
D278-1 or -2	Governor Controller	Submit to RHC Repair Station for 12-year service, or replace with new or overhaul exchange.

1.102 Additional Component Maintenance (continued)

A. 12 YEARS (continued)

Part Number	Description	Action
D321-1	Valve – Pressure Relief (Fuel)	Replace with new D321-1 or D321-4 valve assembly.
D731-1	Bellcrank Assembly – Throttle, R44 II	Visually inspect. If exterior corrosion is evident, remove and inspect tube interior. Verify bearings rotate smoothly without noise. Repair or replace as required.
D731-9	Bellcrank Assembly – Throttle, R44 II (fuel control)	Visually inspect. Replace if corrosion is evident. Verify bearing rotates smoothly without noise.
D756-1	Bellcrank Assembly (forward, R44 II)	Visually inspect. Replace if corrosion is evident. Verify bearing rotates smoothly without noise.
D756-3 & -4	Bellcrank Assembly (forward & aft, R44)	Visually inspect. Replace if corrosion is evident. Verify bearing rotates smoothly without noise.
D778-1	Cartridge – Air Conditioning Pulley Drive (R44 II or Cadet only)	Replace with new.
D918-1 & -2	Elastic Cords – Cyclic	Replace with new.
NAS1149E0363R	Washer (corrosion resistant, mixture arm, 2 each)	Replace with new C141-26 washers, per R44 SL-80.
21FKF-518	Nut (exhaust riser, 12 each)	Replace with new.
21FKF-813 or 27FKF-813	Jam Nut (MR pitch link, 2 each)	Replace with new.

1.102 Additional Component Maintenance (continued)

B. 2200/2400 Hours

Perform action indicated on the following components when they have accumulated 2200 hours (R44 S/Ns 0001 thru 9999 & R44 II S/Ns 10001 thru 29999) or 2400 hours (R44 Cadet S/Ns 30001 & subsequent) time in service since new or since last overhaul:

Part Number	Description	Action
A120-3	Tail Rotor Bellcrank	Replace with new.
A130-21	Spacer (at R44 and R44 Cadet powerplant controls)	Replace with new.
A130-48	Spacer	Replace with new, per R44 SL-80.
A190-3	V-Belt Set	Replace with new.
A336-6, -9	Push-Pull Tube – Throttle (R44 II)	Replace with new.
A462-4	Fitting	Replace with new.
A522-7	Control Cable – Mixture (carburetor)	Replace with new.
A522-13	Control Cable – Mixture (fuel control)	Replace with new.
A595-1	Seal – Vertical Firewall (neoprene)	Replace with new.
A595-2	Seal – Vertical Firewall (Teflon®)	Replace with new.
A650-2 or -4	Fitting – MRGB Mount	Visually inspect, including bore. Replace if worn or corroded. Magnetic particle inspect per § 23-41.
A729-33	Tube (aux fuel pump drain)	Replace with new.
A785-6	Hose (bulkhead to MRGB)	Replace with new.
A785-7	Hose (alternator cooling)	Replace with new.
A785-10	Hose (carb heat scoop to airbox)	Replace with new.
A785-11	Hose (engine LH cowling to airbox)	Replace with new.
A785-12	Hose (scroll to muffler shroud)	Replace with new.
A785-13	Hose (muffler shroud to cabin heat inlet)	Replace with new.
A785-16	Hose (scroll to MRGB)	Replace with new.
A785-17	Hose (scroll to bulkhead)	Replace with new.
A785-19	Hose (magneto cooling)	Replace with new.
A785-28	Hose (bulkhead to hydraulic reservoir)	Replace with new.
A785-31	Hose (R44 II engine air intake)	Replace with new.
A918-1 thru -8	Elastic Cord – Tail Rotor	Replace with new. Dash number is selected during flight test evaluation.
A947-2	Flex Plate Assembly (intermediate)	Replace with new.
B173-2, -3, or -6	V-Belt – Alternator	Replace with new.
B173-4	V-Belt – A/C Compressor Drive	Replace with new.
B277-024	Clamp	Replace with new.
B277-036	Clamp	Replace with new.

1.102 Additional Component Maintenance (continued)

B. 2200/2400 Hours (continued)

Part Number	Description	Action
B283-1	Hose Assembly (oil pressure sender)	Replace with new.
B283-3	Hose Assembly (fuel; various)	Replace with new.
B283-7	Hose Assembly (fuel control to flow divider)	Replace with new.
B283-9 or -11	Hose Assembly (fuel return)	Replace with new B283-11 hose assembly.
B283-10	Hose Assembly (engine-driven pump to fuel control)	Replace with new.
B345-4	Pitch Link (tail rotor)	Replace with new.
B350-3	Spring Pin (fanwheel retaining nut)	Replace with new.
C005-4	C154-1 Main Rotor Hub Assembly	Replace with new.
C005-12	C016-7 Main Rotor Blade & C158-1 Spindle Assembly	Replace with new or overhaul exchange C005-12 main rotor blade & spindle assembly, as required.
C006-3, -6, or -8	Main Rotor Gearbox Assembly	Replace with new or overhaul exchange C006-8 main rotor gearbox assembly.
C007-5	Fanshaft Assembly	Replace with new.
C008-4 or -9	Tail Rotor Assembly	Replace with new C008-9 tail rotor assembly.
C014-X	Landing Gear Assembly	Perform 2200-Hour/2400-Hour service per § 2.650 Part B.
C017-4 or -6	Swashplate Assembly	Replace with new or overhaul exchange C017-6 swashplate assembly.
C018-2 or -3	Clutch Assembly (C166-4 shaft)	Replace with new or overhaul exchange C018-4 or -5 clutch assembly.
C018-4 or -5	Clutch Assembly (C166-5 shaft)	
C020-1	Upper Frame Assembly (standard)	Replace with new.
C020-2	Upper Frame Assembly (with tie-downs)	Replace with new.
C021-1	Tail Rotor Gearbox Assembly	Replace with new or overhaul exchange.
C031-1	Tail Rotor Pitch Control	Replace with new.
C046-1, -19, -21, or -23	Lower Frame Assembly – LH	Remove paint per § 23-71 and MPI per § 23-41. Powder coat per § 23-76 (preferred), or prime & paint per §§ 23-75 & 23-77.
C046-2	Lower Frame Assembly – RH	Remove paint per § 23-71 and MPI per § 23-41. Powder coat per § 23-76 (preferred), or prime & paint per §§ 23-75 & 23-77.
C051-1 or -2	Clutch Actuator Assembly	Replace with new or overhaul exchange.
C106-X	Journal, Main Rotor Hub	Replace with new, or: Visually inspect using 10x magnification for obvious damage; magnetic particle inspect per § 23-41.

1.102 Additional Component Maintenance (continued)

B. 2200/2400 Hours (continued)

Part Number	Description	Action
C119-2	Bumper (tail rotor)	Replace with new.
C121-17	Push-Pull Tube (tailcone)	Replace with new.
C121-25 or -31	Push-Pull Tube Assembly – Swashplate	Disassemble, remove paint per § 23-71, fluorescent penetrant inspect per § 23-42, and replace as required. Clean, prime, & paint per § 23-60.
C152-1	Thrust Washer	Replace with new, or: Visually inspect using 10x magnification for obvious damage; magnetic particle inspect per § 23-41.
C169-1 or -35	Exhaust Muffler Assembly	Replace with new C169-35 assembly.
C169-31 or -37	Exhaust Muffler Assembly	Replace with new C169-37 assembly.
C174-1 Revision A thru F	Support (engine mount at prop governor pad; constant 0.5-inch dia. vertical tube)	Replace C174-1 support, C592-2 link & C592-3 mount with C174-7 support, C174-11 plate & C592-4 mount.
C174-1 Revision G or subsequent	Support (engine mount at prop governor pad; vertical tube lower portion is 0.562 inch dia.)	Strip paint using § 23-71 approved materials. Magnetic particle inspect support per § 23-41. Powder coat per § 23-76 (preferred), or prime & paint per § 23-60.
C174-7	Support Weldment	Liquid-strip paint using § 23-71 approved materials only. Magnetic particle inspect support per § 23-41. Powder coat per § 23-76 (preferred), or prime & paint per § 23-60. Fill and drain tube interiors using B270-21 protectant.
C174-11	Plate Weldment	Strip paint using § 23-71 approved materials. Magnetic particle inspect plate per § 23-41. Powder coat per § 23-76 (preferred), or prime & paint per § 23-60.
C182-1	Nut (fanwheel retaining)	Replace with new.
C189-14	Nut (MR hub bolt)	Replace with new.
C258-1	Main Rotor Pitch Link Assembly	Replace with new C258-8 link assembly.
C258-5 or -8	Main Rotor Pitch Link Assembly	Replace with new C258-8 link assembly, or perform inspection per § 2.630 and magnetic particle inspect barrel.
C339-1 or -10	Jackshaft Weldment	Visually inspect. Repair or replace as required.
C343-1*, -9, & -11 (*R44 SL-43 refers)	Push-Pull Tube Assembly – Tail Rotor	Visually inspect. If exterior corrosion is evident, record length, disassemble, and inspect tube interior. Repair or replace as required.

1.102 Additional Component Maintenance (continued)

B. 2200/2400 Hours (continued)

Part Number	Description	Action
C348-5	Anchor Assembly – Seat Belt (Forward)	Replace if seat buckle attaching lugs are less than 0.073 inch thick. Visually inspect. If exterior corrosion is evident, remove and inspect tube interior. Repair or replace as required.
C480-1	Swashplate Boot	Replace with new.
C522-7	Control Cable – Carburetor Heat	Replace with new.
C568-1	Scoop Assembly (carburetor heat)	Replace with new.
C615-1	Gasket (airbox-to-carburetor)	Replace with new.
C627-4, -5, or -6	4-/5-point Harness Assembly	Replace with new.
C628-5, -6, -7, or -8	Connector Assembly	Replace with new.
C649-1	Oil Cooler	Replace with new or overhauled C649-2 oil cooler.
C649-2 & -3	Oil Cooler	Flush & 400-psi pressure test or overhaul or replace with new.
C749-1	Nozzle Assembly (MRGB cooling)	Replace with new.
C792-4 or -5	Dual Tachometer	Replace with new or overhaul exchange.
C907-1 or -2 Revision A thru G (weldment)	Yoke – Clutch Shaft Forward (1.43-inch dia. center hole between arms)	Replace with C907-1 or -2 Revision H or subsequent yoke.
C907-1 or -2 Revision H or subsequent (forging)	Yoke – Clutch Shaft Forward (1.471-inch dia. bore) Yoke is heat-treated steel & cadmium-plated; do not remove gold-colored cadmium plating.	Replace with new, or comply with FAA AD 2025-11-07 (see current revision of R44 Service Letter SL-91).
C918-15	Elastic Cord (collective)	Replace with new A918-20 cord.
C947-1 & -3	Flex Plate Assembly (forward & aft)	Replace with new.
D046-1 & -2	Strut Weldment – LH	Remove paint per § 23-71. MPI per § 23-41. Powder coat per § 23-76 (preferred), or prime & paint per §§ 23-75 & 23-77.
D046-3	Strut Weldment – RH	Remove paint per § 23-71. MPI per § 23-41. Powder coat per § 23-76 (preferred), or prime & paint per §§ 23-75 & 23-77.
D079-1	Tail Rotor Guard Assembly	Replace with new.
D082-1	Tube Assembly (weldment, TR guard)	Replace with new, or: liquid-strip paint per § 23-71, MPI per § 23-41, & prime per § 23-60.
D174-2	Fanwheel	Replace with new or overhaul exchange.

1.102 Additional Component Maintenance (continued)

B. 2200/2400 Hours (continued)

Part Number	Description	Action
D201-5	Support Assembly – Hydraulic Servos (fwd)	Replace with new D201-6 support assembly.
D201-6	Support Assembly – Hydraulic Servos (fwd)	Visually inspect including interior of tube for corrosion. If corrosion is found, replace with new.
D203-1	Support Assy, LH – Aft Hydraulic Servo	Remove paint per § 23-71. MPI per § 23-41. Clean, prime, & paint per § 23-60.
D204-8	Support Assy, RH – Aft Hydraulic Servo	Remove paint per § 23-71. MPI per § 23-41. Clean, prime, & paint per § 23-60.
D211-1 or -2	Hydraulic Reservoir	Replace with new or overhaul exchange.
D212-1	Hydraulic Servo Actuators	Replace with new or overhaul exchange.
D224-1 & -2	Tail Rotor Drive Shaft Assembly	Replace with new.
D270-1	Governor Controller (with EMU)	Replace with new or overhaul exchange.
D278-1 or -2	Governor Controller	Replace with new or overhaul exchange.
D321-1	Valve – Pressure Relief (Fuel)	Replace with new D321-1 or D321-4 valve assembly.
D333-3	Fitting (carb heat control cable)	Replace with new.
D500-1	Hydraulic Pump	Replace with new or overhaul exchange.
D543-2	Spacer (fuel control throttle bellcrank)	Replace with new.
D730-8	Brace (fuel control)	Replace with new.
D735-1	Sleeve – Fuel Control Inlet Fitting (orange, insulated)	Remove and discard.
D743-1, -2, -3 or -4	Pump – Fuel (electric)	Replace with new D743-3 pump. For helicopter S/N 13158 and prior equipped with D743-1, -2, or -4 aux fuel pump, also order KI-206-3 Provisions Kit.
D778-1	Cartridge – Air Conditioning Pulley Drive (R44 II or Cadet only)	Replace with new.
D918-1 & -2	Elastic Cords – Cyclic	Replace with new.
D930-1	Mixture Spring (fuel control)	Replace with new.
F628-1	Connector Assembly	Replace with new.
F628-3	Connector Assembly	Replace with new.
F628-7	Buckle Assembly	Replace with new.
KI-6604	C017-5 Swashplate Installation Parts Kit Instructions	Replace existing parts with kit parts.
21FKF-518	Nut (exhaust riser, 12 each)	Replace with new.
AN3-41A	Bolt (oil cooler retaining)	Replace with new.
AN3-44A	Bolt (oil cooler retaining)	Replace with new.
AN735-4	Clamp (mixture cable-to-C577-2 bracket)	Replace with new.

1.102 Additional Component Maintenance (continued)

B. 2200/2400 Hours (continued)

Part Number	Description	Action
MS16562-4	Spring Pin (in D333-3 fitting)	Replace with new.
MS20002-24	Washer (thick, fanwheel retaining nut)	Replace with new.
NAS1149E0363R	Washer (corrosion resistant, mixture arm, 2 each)	Replace with new C141-26 washers, per R44 SL-80.
NAS1149F2432P	Washer (thin, fanwheel retaining nut)	Replace with new.
NAS634-105	Bolt (MR hub)	Replace with new.

C. Engine Maintenance

Refer to latest revisions of Textron Lycoming Service Instruction No. 1009 and Lycoming Service Bulletin No. 240.

D. Airframe and Engine Accessory Maintenance

Refer to accessory manufacturer's instructions for continued airworthiness for accessory maintenance. Remove accessories per R44 Maintenance Manual or accessory manufacturer's instructions as required.

1.115 Chip Detector Cleaning

NOTE

During normal operation of gearboxes using A257-2 oil, an insulating film of varnish can accumulate on a chip detector's magnet which could prevent metallic debris from illuminating the chip warning light. Proper cleaning of chip detectors per the following steps is critical to chip detector function.

WARNING

Review appropriate Safety Data Sheet (SDS) when working in proximity to hazardous materials. Specific recommendations for use of personal protective equipment are located in the SDS.

1. Remove and discard safety wire, if applicable, securing chip detector. Disconnect chip detector wiring from airframe harness at connectors. For tail gearbox, place suitable drain container below gearbox to catch oil and remove chip detector.
2. Clean chip detector using a toothbrush and approved solvent (refer to § 23-72). Remove debris using compressed air or masking tape; do not use a magnet. Dry chip detector using compressed air or a lint-free cloth. Inspect condition.
3. Connect chip detector wiring to airframe harness at connectors. Turn battery switch on. Touch detector's magnet to airframe and verify appropriate gearbox caution light illuminates. Turn battery switch off. Disconnect chip detector wiring from airframe harness at connectors.
4. Install chip detector. Special torque threaded-type chip detector per § 23-33; install safety wire as required (refer to R44 SL-45). Connect chip detector wiring to airframe harness at connectors.
5. Turn battery switch on. Depress push-to-test button(s) and verify appropriate gearbox caution light illuminates. Turn battery switch off.

1.120 Main Rotor Gearbox Drain And Flush

1. Run-up helicopter for approximately five minutes at 60–70% RPM per applicable Pilot's Operating Handbook (POH) Section 4 as required to warm oil and expedite draining.
2. Disconnect chip detector wiring from airframe harness at connectors. Remove chip detector from housing.
3. Check for oil leaking from chip detector housing. Leakage indicates housing is defective and must be replaced. If leakage occurs, immediately install main rotor gearbox drain assembly to minimize oil spillage.

CHAPTER 2

INSPECTION

CHAPTER 2

INSPECTION (Continued)

2.120 Push-Pull Tubes, Rod Ends, and Spherical Bearings

2.121 Push-Pull Tubes

1. Nicks, cuts, or scratches in tube not more than 0.010 inch deep and not more than 1/4 of tube circumference may be polished out in lengthwise direction using 320-grit or finer wet-or-dry abrasive paper to 1-inch minimum blend radius. Replace push-pull tube if depth exceeds these limits.
2. Replace push-pull tube if tube is dented or flattened more than 5% of its diameter in unswaged area; dents or flattening is not permitted in swaged (tapered and threaded) ends of tubes.
3. Replace any C121 push-pull tube if tube threaded end allows insertion of inspection pin beyond allowable limits per following table:

Thread Size	Example Rod End	Maximum Diameter Inspection Pin
10-32	A933-3	0.1730 inch diameter for first 0.09 inch of threads; 0.1670 inch diameter for remaining threads
1/4-28	A127-4	0.2300 inch diameter for first 0.11 inch of threads; 0.2240 inch diameter for remaining threads
5/16-24	A101-4	0.2880 inch diameter for first 0.13 inch of threads; 0.2820 inch diameter for remaining threads
3/8-24	D173-2	0.3520 inch diameter for first 0.15 inch of threads; 0.3440 inch diameter for remaining threads

2.122 Rod Ends and Spherical Bearings

1. Maximum axial play: 0.020 inch (for A104-4 bearing only: 0.035 inch axial play)
   Maximum radial play: 0.010 inch
2. Looseness between spherical bearing outer race & rod end housing, or between spherical bearing outer race & part, is not permitted.
3. Rod ends not riveted in place must block passage of 0.020-inch diameter wire through witness hole. Refer to Figure 2-1 for maximum rod end extension when no witness hole is provided.
4. Rod end jam nuts and stamped nuts must be torqued per § 23-32 and torque striped per Figure 2-1 at the most visible position for pre-flight inspection. Torque stripe must extend across nuts to both rod end shank and push-pull tube (or pitch link barrel, yoke, support, strut, etc.). Torque stripes are subject to deterioration and must be periodically renewed.
5. Refer to Figure 2-1A. Rod ends must be positioned (centered) to allow as much push-pull tube or link rotational movement as possible without binding.

CAUTION

Teflon-lined bearings must not be lubricated or solvent cleaned.

WARNING

Assembly of flight controls is critical and requires inspection by a qualified person. If a second person is not available, RHC recommends the installer take a 5-minute break prior to inspecting flight control connections the installer has assembled.

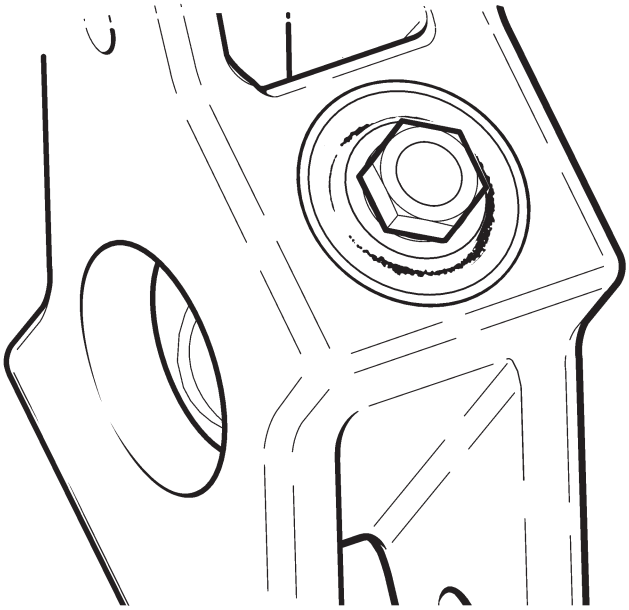

FIGURE 2-2A
ELASTOMER FATIGUE

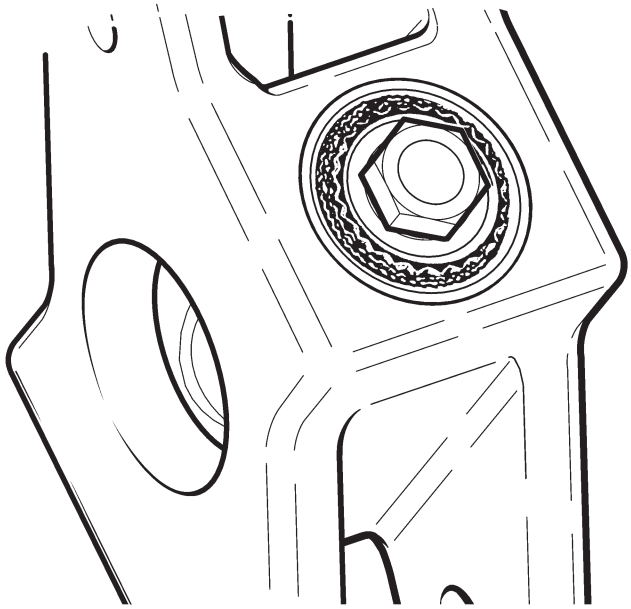

FIGURE 2-2B
ELASTOMER OIL CONTAMINATION

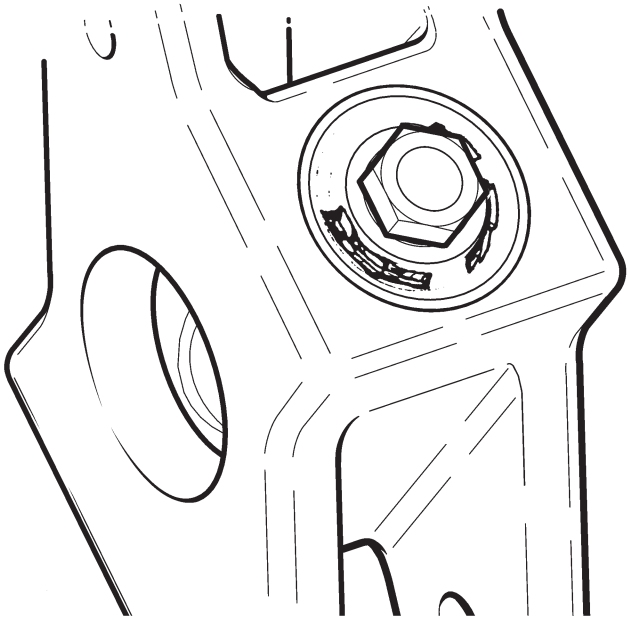

FIGURE 2-2C
ELASTOMER OVERLOAD

2.410 Inspection Procedures and Checklist (continued)

11. Rotor Hub Area (continued)

Install Swashplate Boot Lower Ty-rap: Verify correct boot position and security and no boot damage. _____

Hub: Inspect condition. Verify no nicks, scratches, gouges, or corrosion. If main rotor imbalance is suspected, check teeter and coning hinge friction per § 28-32. Verify no brown or black residue (indicates bearing wear). _____

Hinge Bolts: Inspect condition. Verify cotter pins are in place and secure. Verify bolt heads and nuts are torque striped to thrust washers. _____

Pitch Links and Rod Ends: Inspect condition. Inspect rod ends per § 2.122, including centering. Verify security, including jamnut tightness and proper safety wiring. _____

Fasteners and Torque Stripes: Inspect condition and verify security of all fasteners. Renew deteriorated torque stripes per § 2.140. _____

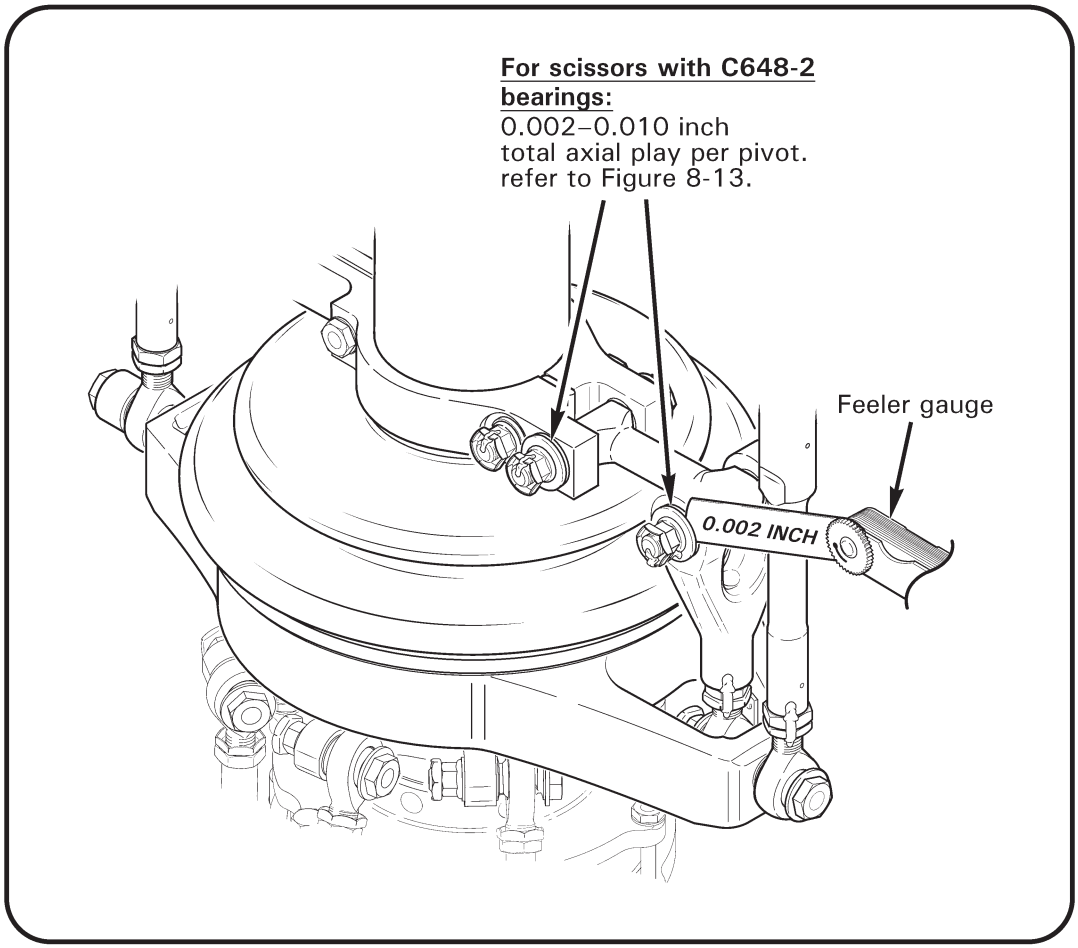

FIGURE 2-9 MEASURING UPPER SWASHPLATE SCISSOR AXIAL CLEARANCE

2.410 Inspection Procedures and Checklist (continued)

12. Main Rotor Blades

Boots: Inspect condition. Verify no boot damage or oil leakage. Verify proper boot position and security. Verify sufficient clearance from hub assembly through full control travel. _____

Blade Spindles & Root Fittings: Inspect area for damage per § 28-43. Verify proper installation and security of visible fasteners. Renew deteriorated torque stripes per Figure 2-1. _____

Main Rotor Blade Tip Maintenance: Perform main rotor blade tip maintenance per § 28-60. _____

Main Rotor Blade Inspection: Inspect skins and doublers for scratches and corrosion per § 28-41. Inspect blades for dents and local deformations per § 28-42 and for voids per § 28-44. As required, wax blades with soft cleaning cloths using carnauba-type wax (such as SC Johnson® Paste Wax). Ensure tip cover and blade tip drain holes are unobstructed. _____

WARNING

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

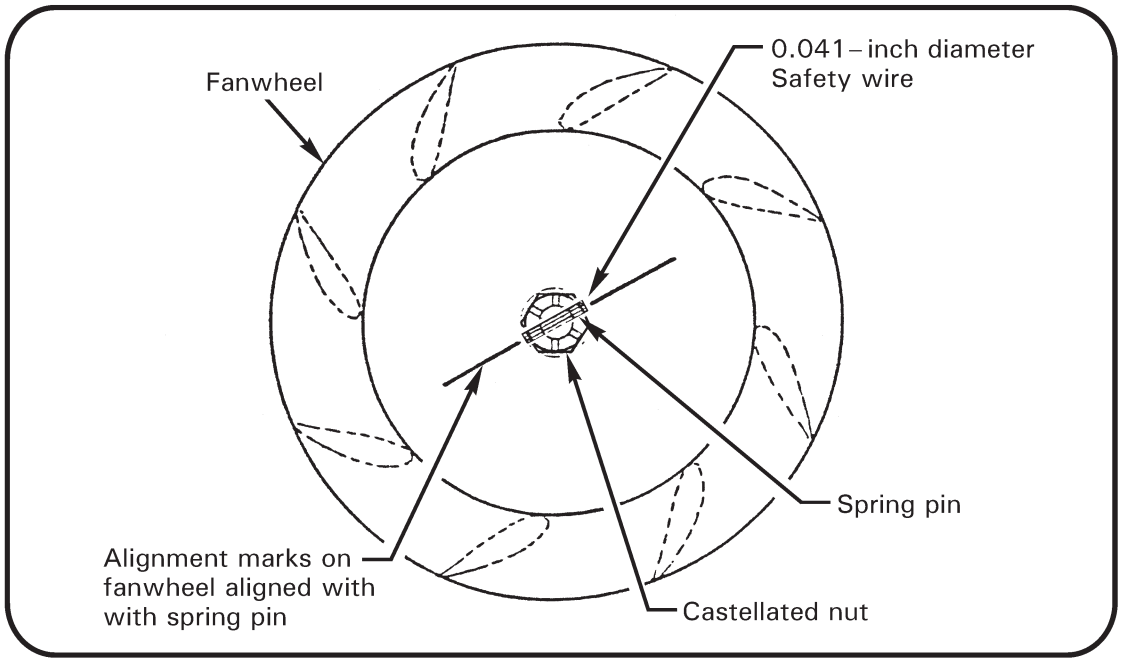

FIGURE 2-10 FANWHEEL ALIGNMENT MARKS

2.620 Fanwheel 12-Year Maintenance

1. If installed, remove D174-2 fanwheel assembly per § 6.210.
2. Mark fanwheel assembly parts, including balancing hardware, for identical reassembly.
3. Refer to Figure 2-19. Loosen bolts securing C187-3 cone assembly and C186-1 hub to fanwheel. Verify hub axial play does not exceed 0.020 inch with hub bolts loose and NAS6603 bolts tight.
4. Remove hardware securing cone assembly, hub, and C178-2 spacer(s) to fanwheel and remove parts, noting relative locations for identical reassembly.
5. Visually inspect all components for obvious damage. Verify no elongation of fastener holes. Replace parts as required.
6. Assemble fanwheel wet with approved primer (chromate primer preferred; refer to § 23-75) between all clamping surfaces; while primer is wet, special torque D210 nuts per § 23-33. Apply B270-21 protectant to threads and tip of B660-1 bolts, if installed.

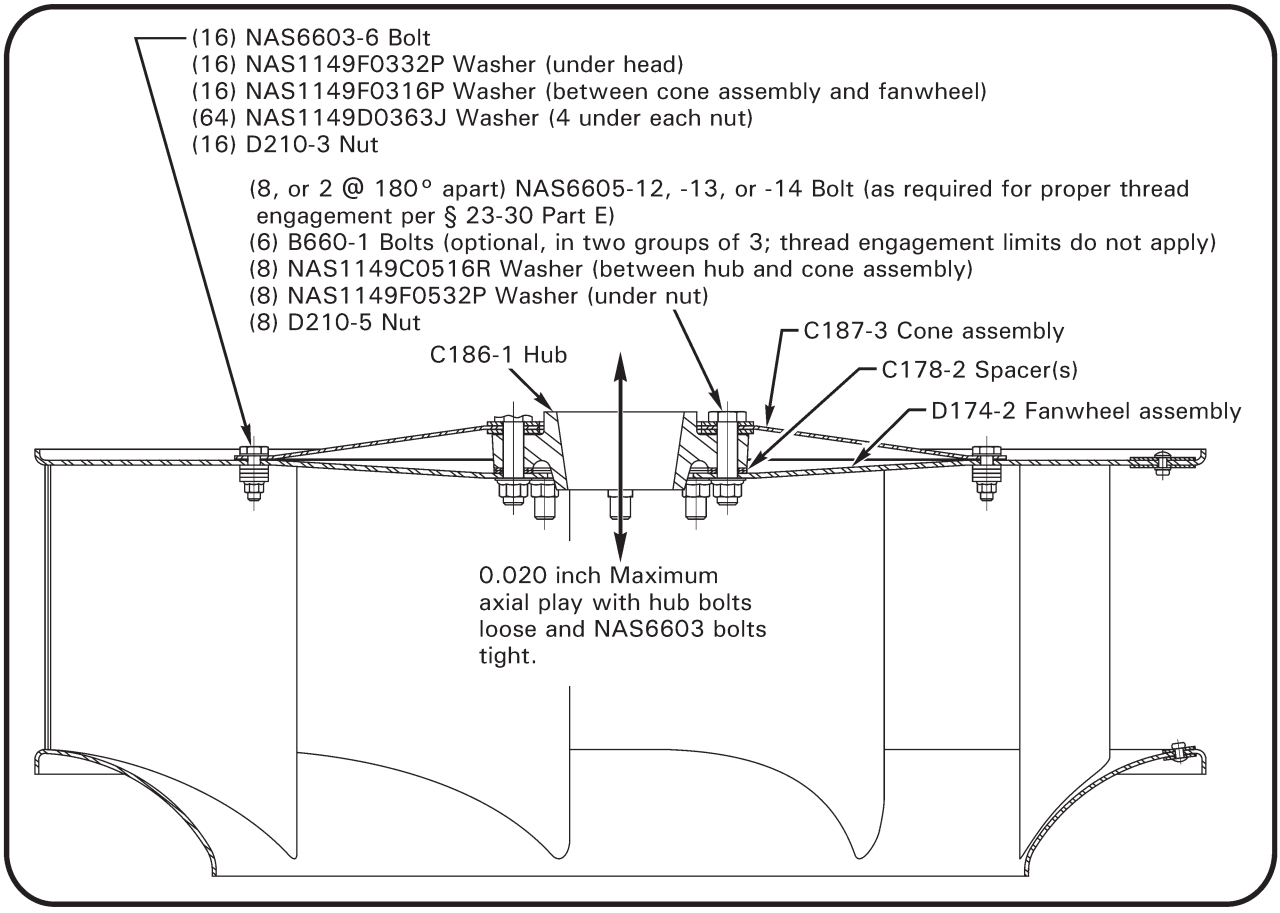

FIGURE 2-19 D174-2 FANWHEEL ASSEMBLY

2.630 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. R44 Service Letters SL-58 and SL-95 refer. Disassemble pitch links, keeping parts from each link separate from the other.
4. Evaluate rod ends per § 2.122 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 § 23-32. Special torque self-locking 21FKF-813 or 27FKF-813 jam nut per § 23-33.
8. Install pitch links to associated swashplate ear and, if installed, main rotor blade. Torque fasteners per § 23-32 and torque stripe per Figure 2-1.

CHAPTER 8

FLIGHT CONTROLS

CHAPTER 8

FLIGHT CONTROLS (Continued)

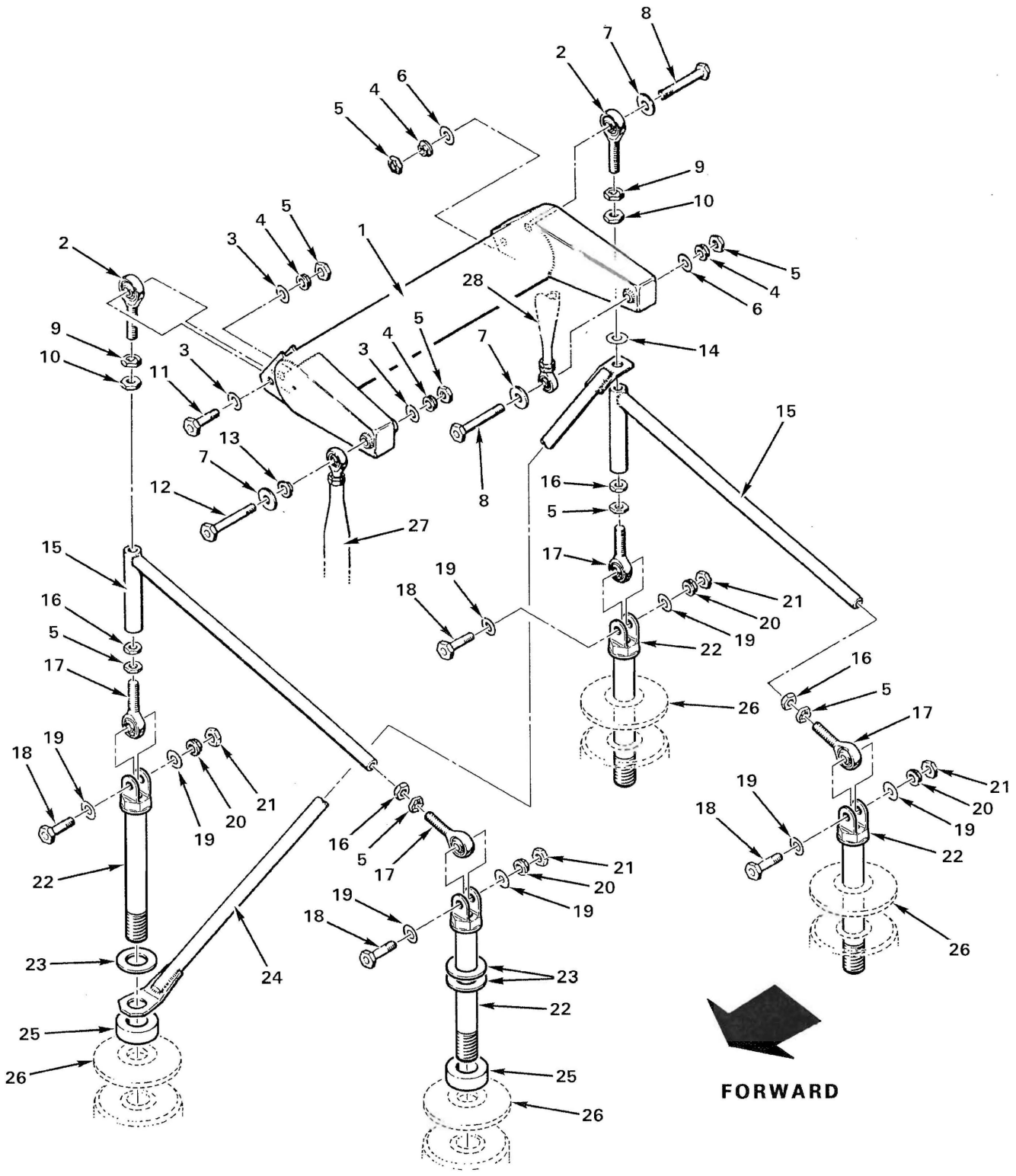

FIGURE 8-9 JACKSHAFT INSTALLATION

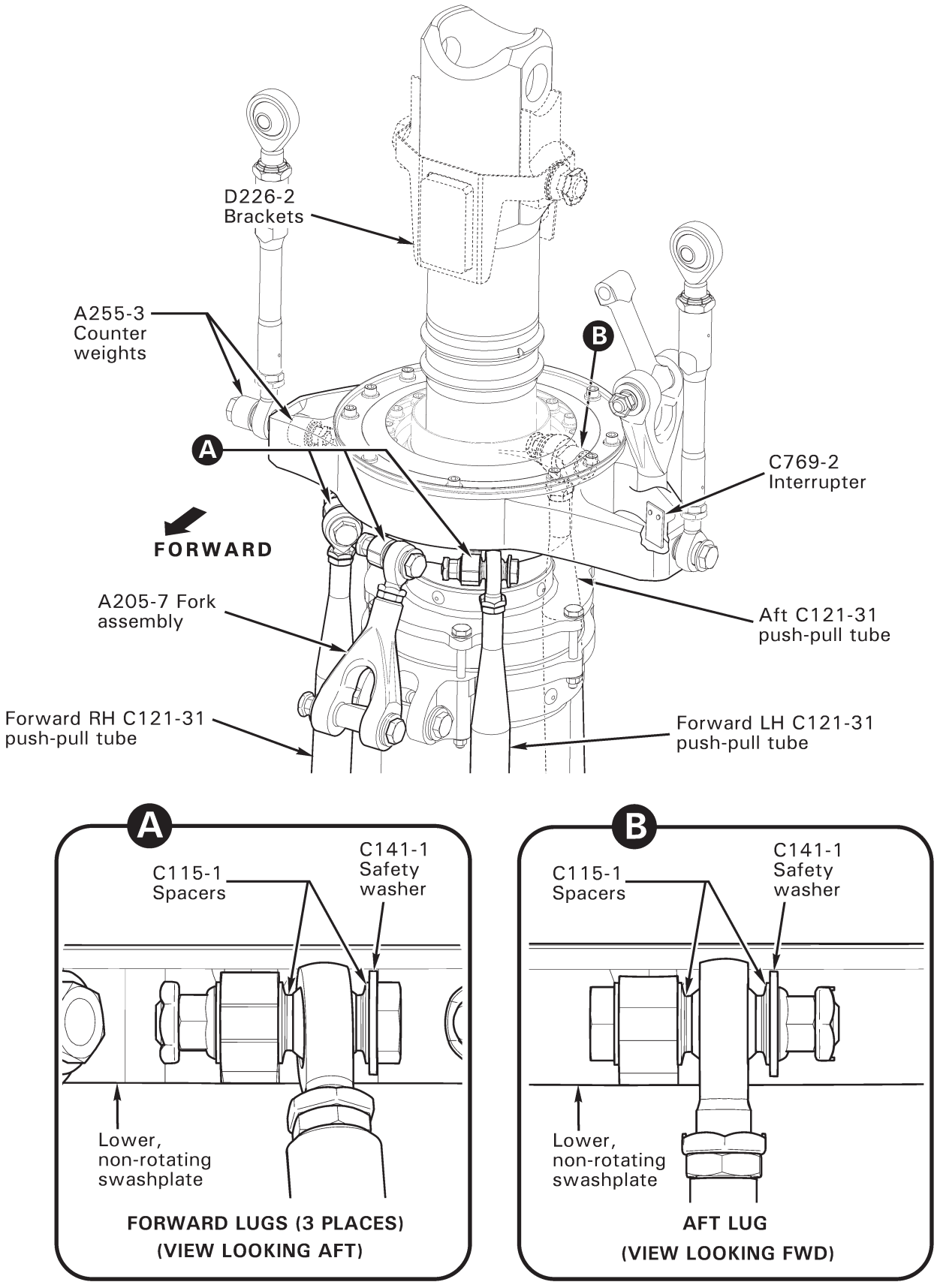

FIGURE 8-10 SWASHPLATE INSTALLATION

8.400 Swashplate and Main Rotor Pitch Links

8.410 Swashplate

8.411 Swashplate Removal

> NOTE
>
> Rigging check is not required if push-pull tube rod end center-to-center dimension does not change.

1. Remove main rotor blades and hub per §§ 28-10 and 28-20.
2. Remove NAS6608 bolt & hardware securing C150-1 droop stops and D226-2 teeter stop brackets to C251-2 main rotor shaft. Remove droop stops and brackets.
3. Remove NAS6605 bolt & hardware, including journals & shims, securing upper C204-3 arm to C203-5 yokes.
4. Remove chord arm weights and securing hardware from C203-5 yokes. Record weights removed for reinstallation.
5. Remove hardware securing C203-5 yokes & A210-1 key to main rotor shaft and remove yokes and key.
6. Mark each swashplate ear to match C258-5 or -8 pitch link marking (ref. § 28-10). Remove hardware securing pitch links and A205-7 fork assembly to upper, rotating swashplate and remove from swashplate.
7. Cut & discard ty-raps securing swashplate boot and remove boot.
8. Remove hardware securing three C121-31 push-pull tubes' upper rod ends and A205-7 fork assembly's rod end to lower, non-rotating swashplate.
9. Carefully lift swashplate assembly off slider tube.

8.412 Swashplate Installation

1. If not previously accomplished, install hardware, journals, and shims securing C204-2 lower arm to mast tube assembly. Standard torque bolt per § 23-32, then verify 0.002—0.010-inch axial play in pivot (ref. Figure 2-9); adjust C117 shim thickness between nut-side journal & thrust washer as required. Install stamped nut and standard torque per § 23-32, and torque stripe per Figure 2-1.
2. If not previously accomplished, install hardware, journals, and shims securing lower A205-7 fork assembly to C204-2 lower arm. Standard torque bolt per § 23-32, then verify 0.002—0.010-inch axial play in pivot (ref. Figure 2-9); adjust C117 shim thickness between nut-side journal & thrust washer as required. Install stamped nut and standard torque per § 23-32, and torque stripe per Figure 2-1.

8.412 Swashplate Installation (continued)

3. Refer to Figure 8-10. Install hardware securing lower A205-7 fork assembly's rod end, and aft C121-31 push-pull tube's upper rod end, to lower swashplate. Standard torque bolts per § 23-32. Install stamped nuts and standard torque per § 23-32, and torque stripe per Figure 2-1.

4. Refer to § 8.413 and ensure swashplate tilting friction is within allowable limits; adjust swashplate friction as required.

5. Slide swashplate boot over main rotor drive shaft and set in place.

6. Refer to Figure 8-13. Install C203-5 yokes on C251-2 main rotor drive shaft's upper flange; ensure round edge of A210-1 key is inserted into upper flange slot to index yokes to main rotor drive shaft. Finger tighten clamping hardware.

CAUTION

NAS6605 bolt securing A210-1 key between yokes must be fully torqued first to obtain proper clamping force.

7. Standard torque NAS6605 bolt securing A210-1 key between yokes per § 23-32. Install stamped nut and standard torque per § 23-32, and torque stripe per Figure 2-1.

8. Standard torque NAS6604 bolt opposite A210-1 key per § 23-32. Install stamped nut and standard torque per § 23-32, and torque stripe per Figure 2-1. A slight gap between yokes opposite A210-1 key is normal.

9. Install hardware securing retained chord arm weights (recorded during removal) to C203-5 yokes. Standard torque bolt per § 23-32. Install stamped nut and standard torque per § 23-32, and torque stripe per Figure 2-1.

10. If not previously accomplished, fill remainder of upper A205-7 fork assembly's rod end threaded hole with B270-13 sealant (ref. § 23-79).

11. Refer to Figure 8-13. Install hardware, journals, and retained shims securing upper C204-3 arm to C203-5 yokes. Standard torque bolt per § 23-32, then verify 0.002—0.010-inch axial play in pivot; adjust C117 shim thickness between nut-side journal & thrust washer as required. Verify arm falls when released from horizontal position. Install stamped nut and standard torque per § 23-32, and torque stripe per Figure 2-1.

12. If not previously accomplished, install hardware, journals, and retained shims securing upper fork assembly to C204-3 arm. Standard torque bolt per § 23-32, then verify 0.002—0.010-inch axial play in pivot; adjust C117 shim thickness between nut-side journal & thrust washer as required. With arm held stationary, verify fork falls when released from horizontal position. Install stamped nut and standard torque per § 23-32, and torque stripe per Figure 2-1.

8.412 Swashplate Installation (continued)

13. Refer to Figure 8-10. Install hardware securing two forward C121-31 push-pull tubes' upper rod ends to lower swashplate lugs. Standard torque bolts per § 23-32. Install stamped nuts and standard torque per § 23-32, and torque stripe per Figure 2-1.

14. Align upper swashplate interrupter-side ear to upper A205-7 fork assembly. Install hardware securing upper fork assembly's rod end and correctly matched C258-5 or -8 pitch link's lower rod end to interrupter-side swashplate ear. Standard torque bolt per § 23-32. Install stamped nut and standard torque per § 23-32, and torque stripe per Figure 2-1.

15. Install hardware & two A255-3 counterweights securing correctly matched C258-5 or -8 pitch link's lower rod end to non-interrupter-side swashplate ear. Standard torque bolt per § 23-32. Install stamped nut and standard torque per § 23-32, and torque stripe per Figure 2-1.

16. Position swashplate boot on upper, rotating swashplate and secure in place using MS3367-6-0 ty-rap. With boot upper lip contacting C203-5 yokes, secure in place using MS3367-7-0 ty-rap. Cinch ty-raps until snug without over-tightening, and trim tips flush with heads.

CAUTION

Do not drop NAS634-105 bolt or C106-5 journals when aligning droop stops.

17. Temporarily install teeter hinge bolt & nut finger tight with both journals in main rotor shaft. Press each journal against shaft for droop stop alignment.

18. Position C150-1 droop stops and D226-2 brackets & D151-2 teeter stops on main rotor shaft. Ensure droop stops are aligned to teeter bolt's journals and install NAS6608 bolt & associated hardware securing stops and brackets to shaft. Ensure teeter stops are pressed against shaft, then standard torque bolt per § 23-32. Install stamped nut and standard torque per § 23-32, and torque stripe per Figure 2-1.

19. Install main rotor hub and blades per §§ 28-20 and 28-10.

20. Verify no interference with control movement throughout flight control travel, and swashplate movement corresponds with cyclic and collective movement.

21. Perform main rotor track and balance per § 10.230.

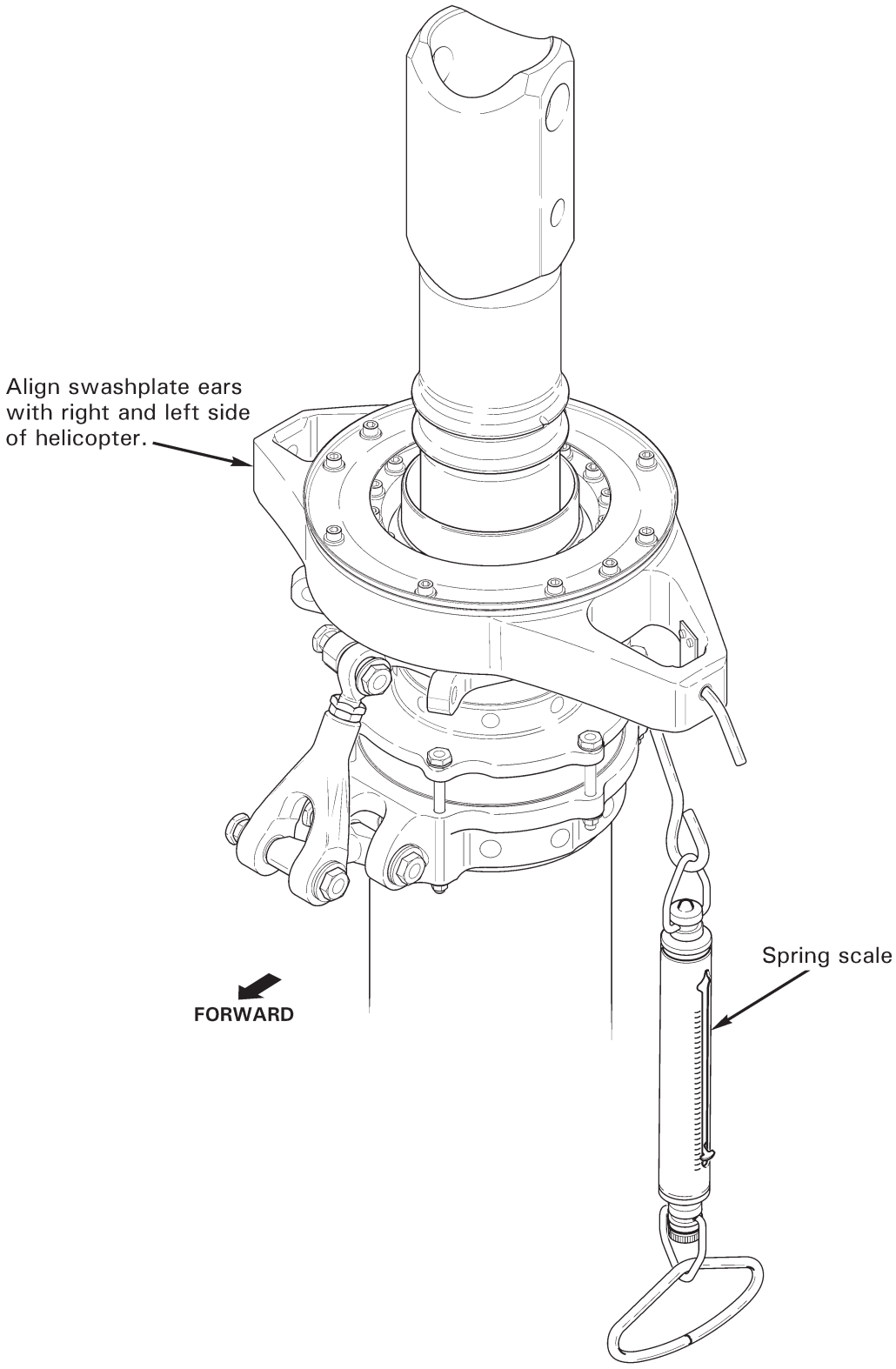

FIGURE 8-11 MEASURING SWASHPLATE TILTING FRICTION

8.413 Swashplate Tilting Friction Adjustment

Swashplate tilting friction is established by C197-1 through C197-6 spacers controlling clamping force of Teflon-lined sleeves on the ball assembly.

1. Mark for reassembly and disconnect boot, pitch links and drive linkage (scissors) from upper swashplate. Disconnect two forward push-pull tubes from lower swashplate.
2. Refer to Figure 8-11. Align upper swashplate arms with lateral axis of helicopter and center cyclic stick. Using MT359-1 spring scale (or equivalent) connected to upper swashplate arm bolt hole, pull down and note scale reading while swashplate is moving; do not use breakaway reading. For C017-6, force required to tilt swashplate must be between 2 and 7 pounds. For C017-4, force required to tilt swashplate must be free-without-looseness minimum to 5 pounds maximum.
3. Refer to Figure 8-12. To adjust friction, remove outer screws from upper swashplate and raise and secure retainers to allow access to inner screws. Remove inner screws securing sleeve to lower swashplate.
4. Raise sleeve and measure thickness of C197 spacer stack. Adjust spacer stack thickness as required, but not exceeding 0.150 inch, to achieve proper tilting friction. Decreasing spacer stack thickness increases tilting friction while increasing spacer stack thickness decreases tilting friction. All inner screws must be installed and special torqued per § 23-33 prior to measuring friction.
5. As required, safety wire inner screws with 0.020 inch diameter safety wire. Secure retainers to upper swashplate with outer screws, special torque per § 23-33, and safety wire as required.
6. Refer to Figure 8-10. Install hardware securing two forward C121-31 push-pull tubes' upper rod ends to lower swashplate lugs. Standard torque bolts per § 23-32. Install stamped nuts and standard torque per § 23-32, and torque stripe per Figure 2-1.
7. Align upper swashplate interrupter-side ear to upper A205-7 fork assembly. Install hardware securing upper fork assembly's rod end and correctly matched C258-5 or -8 pitch link's lower rod end to interrupter-side swashplate ear. Standard torque bolt per § 23-32. Install stamped nut and standard torque per § 23-32, and torque stripe per Figure 2-1.
8. Install hardware & two A255-3 counterweights securing correctly matched C258-5 or -8 pitch link's lower rod end to non-interrupter-side swashplate ear. Standard torque bolt per § 23-32. Install stamped nut and standard torque per § 23-32, and torque stripe per Figure 2-1.
9. Position swashplate boot on upper, rotating swashplate and secure in place using MS3367-6-0 ty-rap. With boot upper lip contacting C203-5 yokes, secure in place using MS3367-7-0 ty-rap. Cinch ty-raps until snug without over-tightening, and trim tips flush with heads.

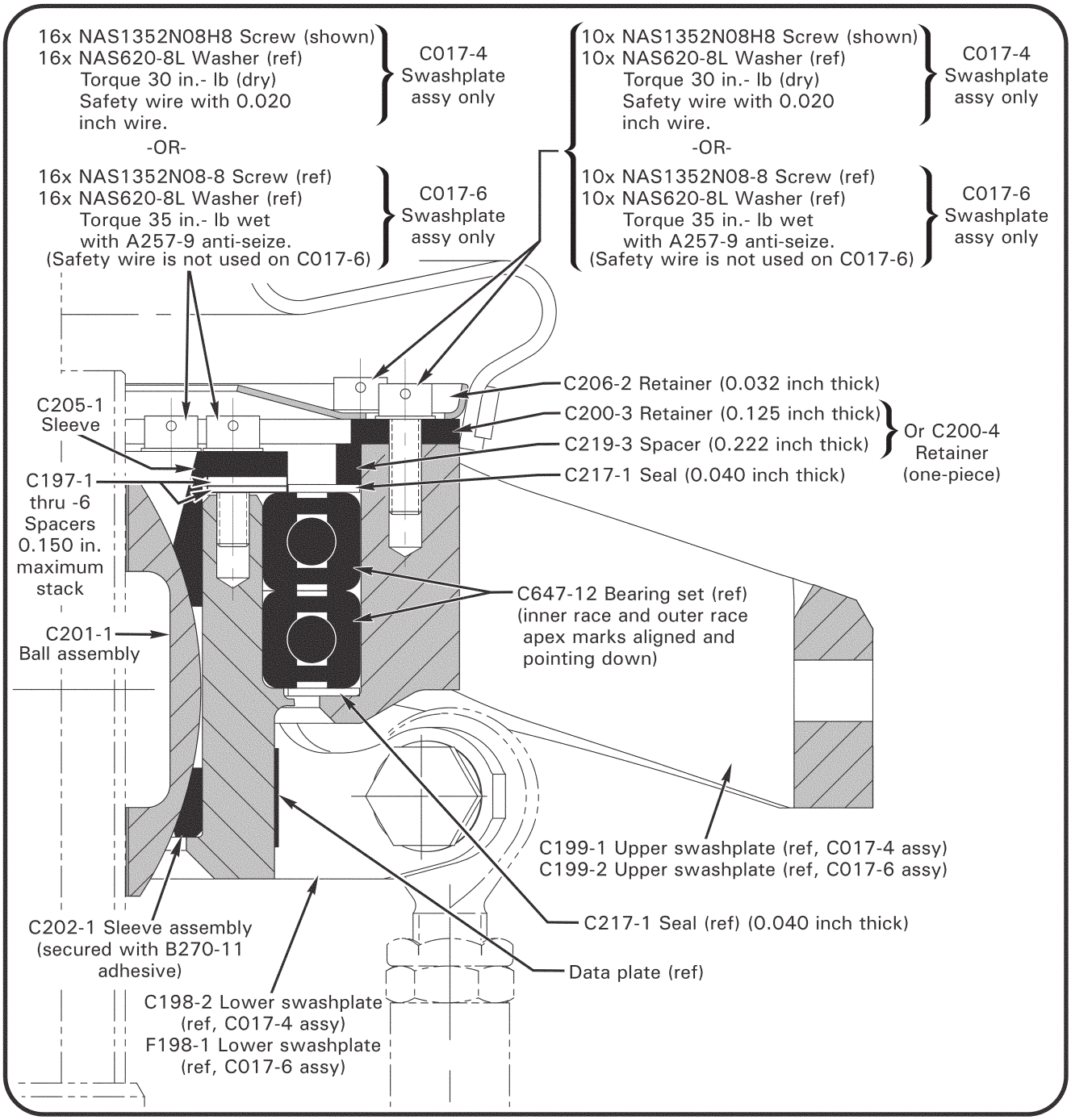

FIGURE 8-12 SWASHPLATE ASSEMBLY

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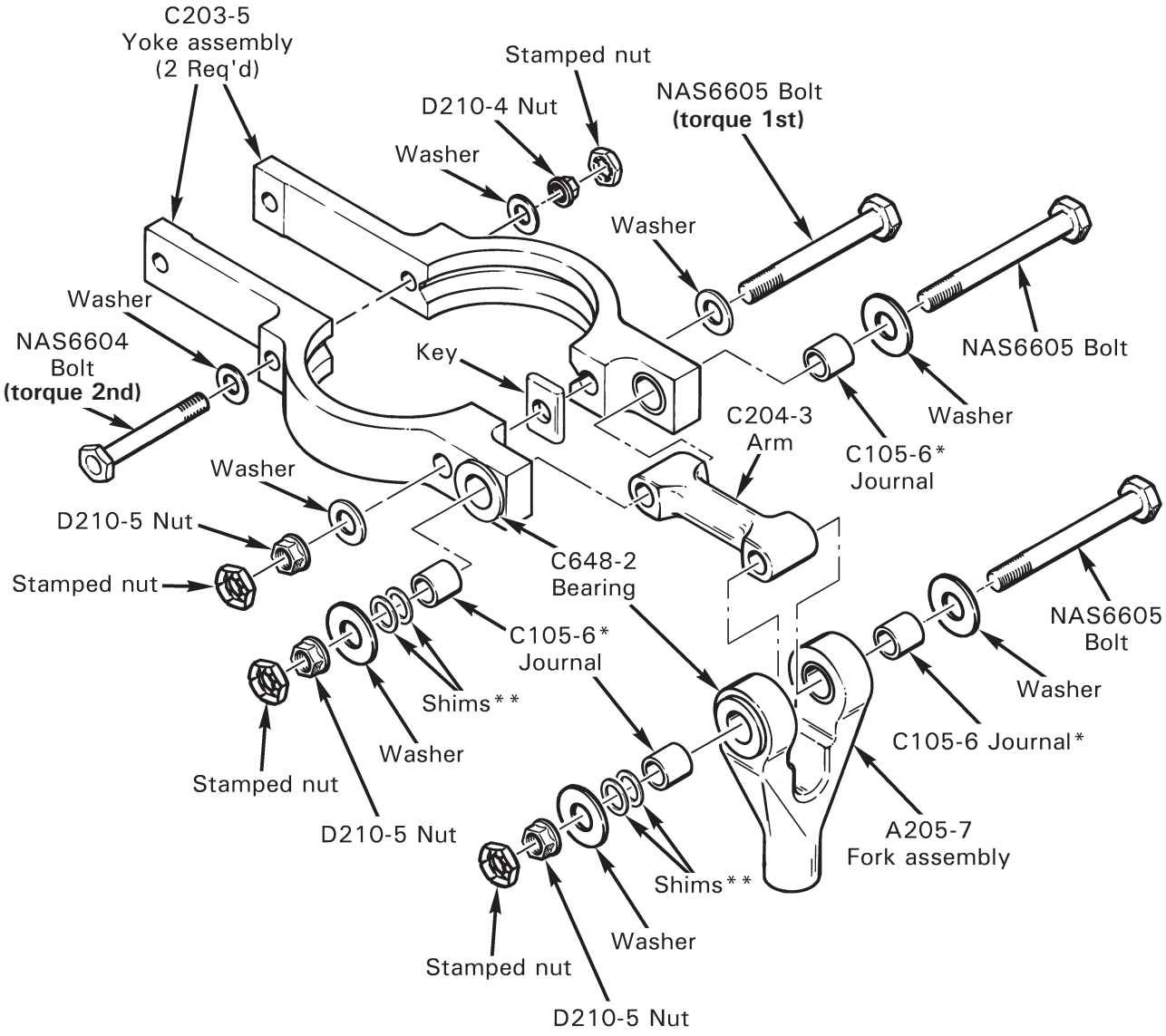
8.500 Tail Rotor Controls

8.510 Tail Rotor Pedals

8.511 Tail Rotor Pedal Removal

1. Remove carpet to access pedal covers per § 15.310 or § 15.320 as required.
2. Remove screws between pedals securing access plates to floor and remove plates.
3. Open or remove console as required per § 13-80. If applicable, disconnect intercom system controller and outside air temperature gage wiring.
4. Remove radios, radio face plate and radio rack by removing screws securing rack to sides of console.



***C105-6 journal (0.525–0.527-inch length) & shims** supersede earlier C105-4** & C105-5** journals without shims.**

****Select a combination of C117-67, -68, and/or -69 shims (or combination of C105-4 or C105-5 journals – earlier R44s) to provide 0.002–0.010 inch axial play in joint (ref. Figure 2-9).**

FIGURE 8-13 R44 & R44 II CHORD ARM YOKE INSTALLATION

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CHAPTER 10

RIGGING, TRACK AND BALANCE

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10.231 Main Rotor Balance Adjustment

WARNING

A rotor which is smooth after balancing but goes out of balance within a few flights is suspect and must be examined by RHC before further flight.

A. Tip Weights (Spanwise Balance Adjustment)

1. Remove screws securing tip cover to blade. Balance rotor assembly spanwise by adjusting tip weights as required per Figure 10-10. Washers may be trimmed. Refer to Figure 10-11. Apply light coat A257-9 anti-seize to threads and install screws securing tip weights to blade; special torque screws to 40 in.-lb. Apply light coat A257-9 anti-seize to threads and install screws securing tip cover to blade; special torque screws to 40 in.-lb.

(1) AN960-10 or NAS1149F0363P Washer	=	(2) AN960-10L or NAS1149F0332P Washers
(1) C298-2 Weight	=	(5) AN960-10 or NAS1149F0363P Washers
(1) C298-3 Weight	=	(11) AN960-10 or NAS1149F0363P Washers
(1) C298-4 Weight	=	(4) C298-3 Weights

B. Teeter Hinge Bolt Shims (Chordwise Balance Adjustment - Coarse Adjustment)

1. Remove and discard teeter hinge nut cotter pin. Remove nut, thrust washer, and any shims.
2. Have two people cone the main rotor blades. Push out teeter hinge bolt (and any shims) with another bolt.
3. Balance rotor assembly chordwise by moving (or exchanging) existing teeter hinge shims to other side of bolt (under head or under nut) as required per Figure 10-10. Install teeter hinge bolt per § 28-10.

C. Chord Arm Weight (Chordwise Balance Adjustment - Fine Adjustment)

1. Balance rotor assembly chordwise by adjusting chord arm weights or washers per Figure 10-10. Total weight not to exceed four A255-2 weights (or equivalent).

(1) A255-1 Weight	=	(8) AN970-4 Washers
(1) A255-2 Weight	=	(3) A255-1 Weights

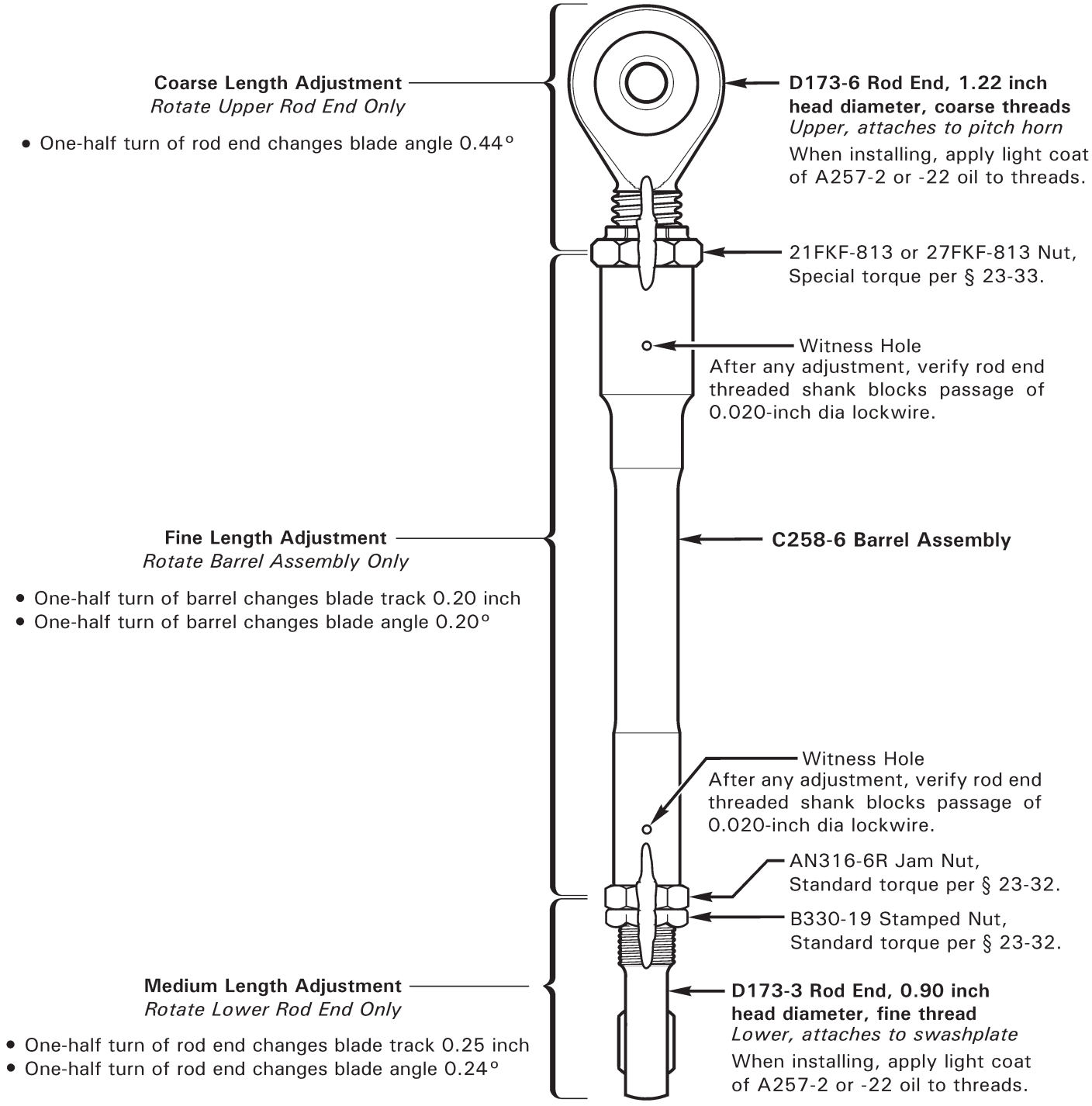

FIGURE 10-12A C258-8 MAIN ROTOR PITCH LINK

10.232 Main Rotor Pitch Link Adjustment

NOTE

Shorten high pitch blade when adjusting track in a hover.

NOTE

During rigging, adjust both pitch links exactly the same for collective adjustments.

NOTE

Adjustment procedures vary by pitch link part number. Perform adjustment procedure per Part A, B, or C that corresponds to installed pitch links.

A. C258-8 Pitch Link Adjustment

CAUTION

C258-8 pitch link assembly must be installed in pairs.

Fine Length Adjustment: Adjust barrel assembly only, per the following steps:

1. Refer to Figure 10-12A. Using backup wrench on barrel assembly, loosen stamped nut and jam nut at lower rod end, and 21FKF-813 or 27FKF-813 nut at upper rod end.
2. Rotate barrel assembly to shorten or lengthen pitch link as required. One-half turn of barrel changes blade track approximately 0.20 inch. One-half turn of barrel changes blade angle approximately 0.20°. For finer adjustment, rotate less than one-half turn as required.
3. Refer to Figures 2-1 & 2-1A. Position rod ends to allow as much pitch link rotation as possible without binding. Using backup wrench on barrel assembly, special torque 21FKF-813 or 27FKF-813 nut per § 23-33, and standard torque jam nut and stamped nut at lower rod end per § 23-32. Verify rod ends' threaded shanks block passage of 0.020-inch diameter lockwire through barrel assembly witness holes. Torque stripe link per Figure 10-12A.
4. Repeat steps on opposite pitch link as required.

10.232 Main Rotor Pitch Link Adjustment (continued)

A. C258-8 Pitch Link Adjustment (continued)

Medium Length Adjustment: Adjust lower rod end only, per the following steps:

1. Refer to Figure 10-12A. Using backup wrench on barrel assembly, loosen stamped nut and jam nut at lower rod end. Remove hardware securing lower rod end to swashplate.
2. Rotate lower rod end to shorten or lengthen pitch link as required. One-half turn of lower rod end changes blade track approximately 0.25 inch. One-half turn of lower rod end changes blade angle by approximately 0.24°.
3. Install hardware securing rod end to swashplate and standard torque fasteners per § 23-32. Torque stripe per Figure 2-1.
4. Refer to Figures 2-1 & 2-1A. Position lower rod end to allow as much pitch link rotation as possible without binding. Using backup wrench on barrel assembly, standard torque jam nut and stamped nut at lower rod end per § 23-32. Verify lower rod end threaded shank blocks passage of 0.020-inch diameter lockwire through barrel assembly lower witness hole. Torque stripe link per Figure 10-12A.
5. Repeat steps on opposite pitch link as required.

Coarse Length Adjustment: Adjust upper rod end only, per the following steps:

1. Refer to Figure 10-12A. Using backup wrench on barrel assembly, loosen 21FKF-813 or 27FKF-813 nut at upper rod end. Remove hardware securing upper rod end to pitch horn.
2. Rotate upper rod end to shorten or lengthen pitch link as required. One-half turn of upper rod end changes blade angle by approximately 0.44°.
3. Install hardware securing rod end to pitch horn and standard torque fasteners per § 23-32. Torque stripe per Figure 2-1.
4. Refer to Figures 2-1 & 2-1A. Position upper rod end to allow as much pitch link rotation as possible without binding. Using backup wrench on barrel assembly, special torque 21FKF-813 or 27FKF-813 nut per § 23-33. Verify upper rod end threaded shank blocks passage of 0.020-inch diameter lockwire through barrel assembly upper witness hole. Torque stripe link per Figure 10-12A.
5. Repeat steps on opposite pitch link as required.

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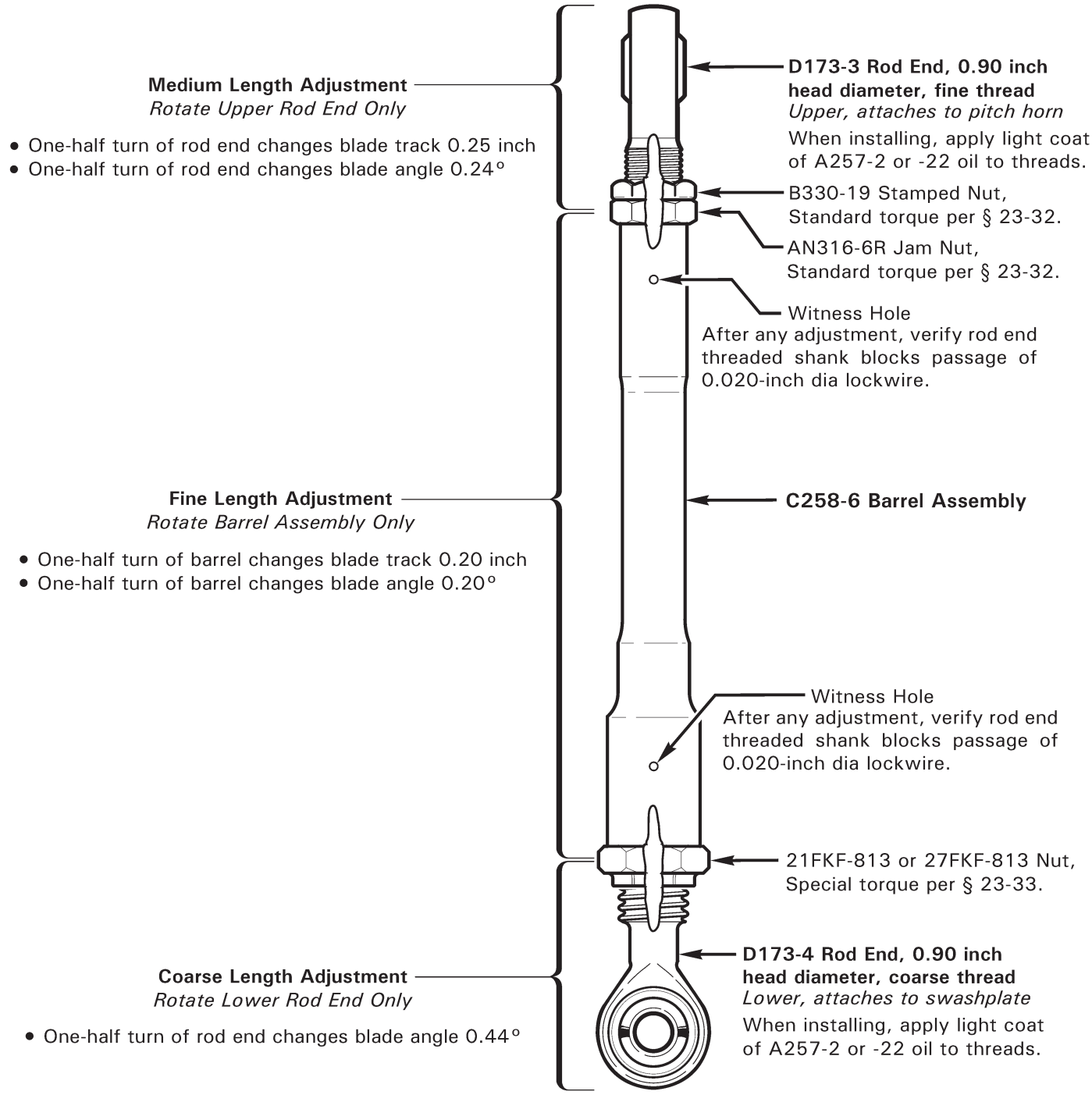

FIGURE 10-12B C258-5 MAIN ROTOR PITCH LINK

10.232 Main Rotor Pitch Link Adjustment (continued)

B. C258-5 Pitch Link Adjustment

Fine Length Adjustment: Adjust barrel assembly only, per the following steps:

1. Refer to Figure 10-12B. Using backup wrench on barrel assembly, loosen 21FKF-813 or 27FKF-813 nut at lower rod end, and stamped nut and jam nut at upper rod end.
2. Rotate barrel assembly to shorten or lengthen pitch link as required. One-half turn of barrel changes blade track approximately 0.20 inch. One-half turn of barrel changes blade angle approximately 0.20°. For finer adjustment, rotate less than one-half turn as required.
3. Refer to Figures 2-1 & 2-1A. Position rod ends to allow as much pitch link rotation as possible without binding. Using backup wrench on barrel assembly, special torque 21FKF-813 or 27FKF-813 nut per § 23-33, and standard torque jam nut and stamped nut at upper rod end per § 23-32. Verify rod ends' threaded shanks block passage of 0.020-inch diameter lockwire through barrel assembly witness holes. Torque stripe link per Figure 10-12B.
4. Repeat steps on opposite pitch link as required.

Medium Length Adjustment: Adjust upper rod end only, per the following steps:

1. Refer to Figure 10-12B. Using backup wrench on barrel assembly, loosen stamped nut and jam nut at upper rod end. Remove hardware securing rod end to pitch horn.
2. Rotate upper rod end to shorten or lengthen pitch link as required. One-half turn of upper rod end changes blade track approximately 0.25 inch. One-half turn of upper rod end changes blade angle by approximately 0.24°.
3. Install hardware securing rod end to pitch horn and standard torque fasteners per § 23-32. Torque stripe per Figure 2-1.
4. Refer to Figures 2-1 & 2-1A. Position upper rod end to allow as much pitch link rotation as possible without binding. Using backup wrench on barrel assembly, standard torque jam nut and stamped nut at upper rod end per § 23-32. Verify upper rod end threaded shank blocks passage of 0.020-inch diameter lockwire through barrel assembly upper witness hole. Torque stripe link per Figure 10-12B.
5. Repeat steps on opposite pitch link as required.

10.232 Main Rotor Pitch Link Adjustment (continued)

B. C258-5 Pitch Link Adjustment (continued)

Coarse Length Adjustment: Adjust lower rod end only, per the following steps:

1. Refer to Figure 10-12B. Using backup wrench on barrel assembly, loosen 21FKF-813 or 27FKF-813 nut at lower rod end. Remove hardware securing lower rod end to swashplate.
2. Rotate lower rod end to shorten or lengthen pitch link as required. One-half turn of lower rod end changes blade angle by approximately 0.44°.
3. Install hardware securing rod end to swashplate and standard torque fasteners per § 23-32. Torque stripe per Figure 2-1.
4. Refer to Figures 2-1 & 2-1A. Position lower rod end to allow as much pitch link rotation as possible without binding. Using backup wrench on barrel assembly, special torque 21FKF-813 or 27FKF-813 nut per § 23-33. Verify lower rod end threaded shank blocks passage of 0.020-inch diameter lockwire through barrel assembly lower witness hole. Torque stripe link per Figure 10-12B.
5. Repeat steps on opposite pitch link as required.

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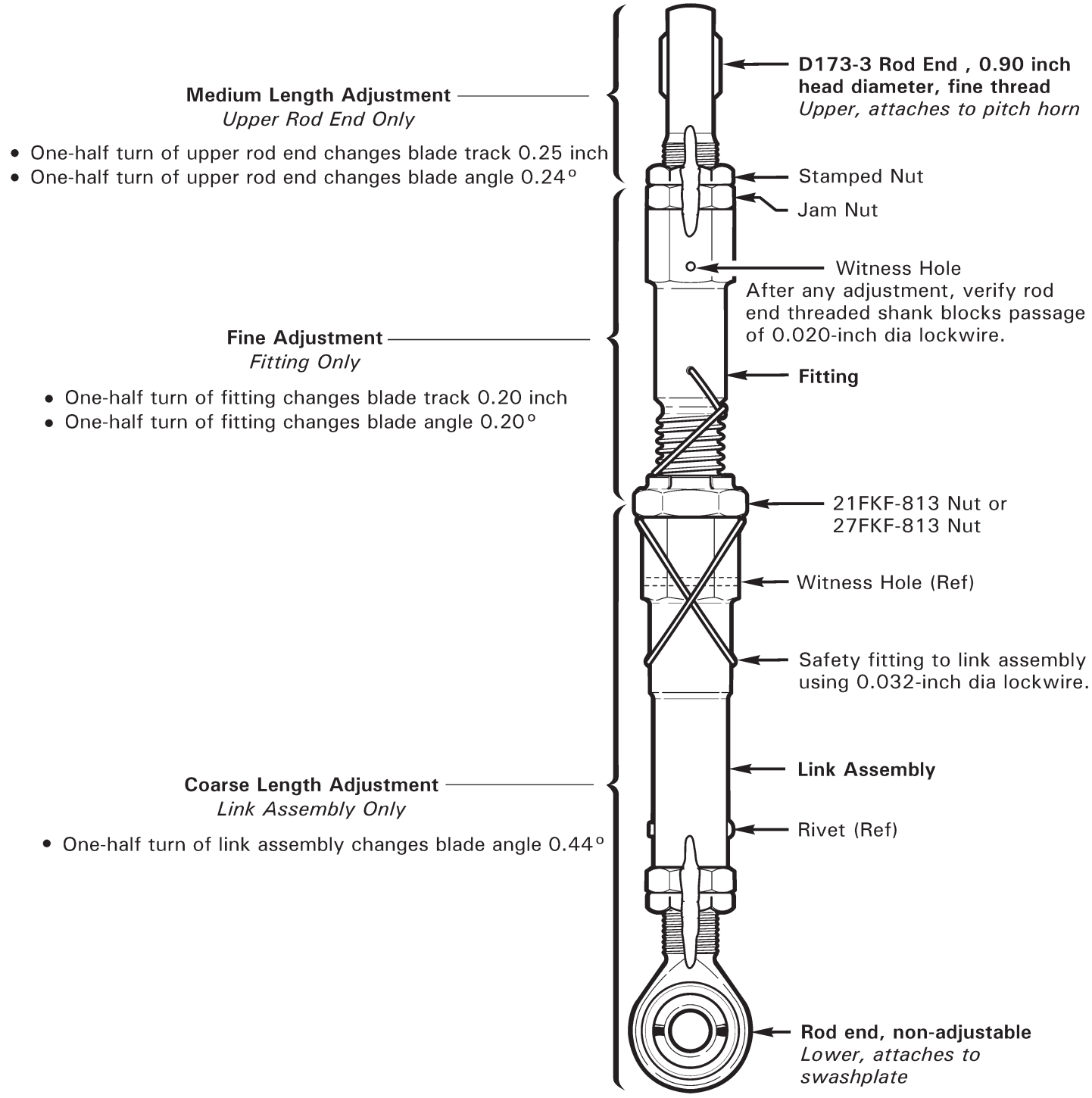

FIGURE 10-12C C258-1 MAIN ROTOR PITCH LINK

10.232 Main Rotor Pitch Link Adjustment (continued)

C. C258-1 Pitch Link Adjustment

Fine Length Adjustment: Adjust fitting only, per the following steps:

1. Refer to Figure 10-12C. Cut and discard pitch link assembly safety wire. Using backup wrench on link assembly, loosen 21FKF-813 or 27FKF-813 nut; using backup wrench on fitting, loosen stamped nut and jam nut at upper rod end.
2. Rotate fitting to shorten or lengthen pitch link as required. One-half turn of fitting changes blade track approximately 0.20 inch. One-half turn of fitting changes blade angle approximately 0.20°. For finer adjustment, rotate less than one-half turn as required.
3. Refer to Figure 2-1A. Position rod ends to allow as much pitch link rotation as possible without binding.
4. Using backup wrench on link assembly, special torque 21FKF-813 or 27FKF-813 nut per § 23-33. Using backup wrench on fitting, standard torque jam nut and stamped nut at upper rod end per § 23-32. Verify upper rod end and fitting threaded shanks block passage of 0.020-inch diameter lockwire thru witness holes. Safety fitting to link assembly using 0.032-inch diameter lockwire. Torque stripe link per Figure 10-12C.
5. Repeat steps on opposite pitch link as required.

Medium Length Adjustment: Adjust upper rod end only, per the following steps:

1. Refer to Figure 10-12C. Using backup wrench on fitting, loosen stamped nut and jam nut at upper rod end. Remove hardware securing rod end to pitch horn.
2. Rotate upper rod end to shorten or lengthen pitch link as required. One-half turn of upper rod end changes blade track approximately 0.25 inch. One-half turn of upper rod end changes blade angle by approximately 0.24°.
3. Install hardware securing rod end to pitch horn and standard torque fasteners per § 23-32. Torque stripe per Figure 2-1.
4. Refer to Figure 2-1A. Position upper rod end to allow as much pitch link rotation as possible without binding. Using backup wrench on fitting, standard torque jam nut and stamped nut at upper rod end per § 23-32. Verify upper rod end's threaded shank blocks passage of 0.020-inch diameter lockwire through fitting witness hole. Torque stripe link per Figure 10-12C.
5. Repeat steps on opposite pitch link as required.

10.232 Main Rotor Pitch Link Adjustment (continued)

C. C258-1 Pitch Link Adjustment (continued)

Coarse Length Adjustment: Adjust link assembly only, per the following steps:

1. Refer to Figure 10-12C. Cut and discard pitch link assembly safety wire. Using backup wrench on link assembly, loosen 21FKF-813 or 27FKF-813 nut. Remove hardware securing link assembly to swashplate.
2. Rotate link assembly to shorten or lengthen pitch link as required. One-half turn of link assembly changes blade angle by approximately 0.44°.
3. Install hardware securing link assembly's lower rod end to swashplate and standard torque fasteners per § 23-32. Torque stripe per Figure 2-1.
4. Position combined fitting & upper rod end to allow as much pitch link rotation as possible without binding. Using backup wrench on link assembly, special torque 21FKF-813 or 27FKF-813 nut per § 23-33. Verify fitting's threaded shank blocks passage of 0.020-inch diameter lockwire through link assembly witness hole. Safety fitting to link assembly using 0.032-inch diameter lockwire. Torque stripe link per Figure 10-12C.
5. Repeat steps on opposite pitch link as required.

10.250 Autorotational RPM Adjustment

Use the following procedure for checking and adjusting autorotational RPM:

WARNING

Failure to properly adjust autorotational RPM (RPM too low) may prevent the rotorcraft from achieving proper RPM at low gross weights.

NOTE

Weight onboard = combined weight of fuel, people, & cargo onboard the helicopter.

1. Perform autorotation RPM check at less than 1900 lb gross weight. Calculate the weight onboard of the helicopter. Record the time on the hourmeter.

   Weight onboard at take-off _____

   Take-Off hourmeter reading _____

2. Set the altimeter to 29.92" Hg (1013.2 millibars) prior to performing the autorotation. Autorotate with the collective control firmly held against the down stop with an airspeed of 50 KIAS.

WARNING

Do not allow the rotor to overspeed when performing autorotation checks. Progressively lengthen both main rotor pitch link rod ends until full down collective can be obtained without overspeeding the rotor.

Take at least 3 RPM readings at 500 to 1000 foot altitude intervals. Record the following in-flight data:

Test No.	1	2	3	4	5
Hourmeter Reading					
OAT					
Pressure Altitude					
Test %RPM					

10.250 Autorotational RPM Adjustment (continued)

3. After test flight, refer to Figure 10-17 chart and determine following:

Test No.	1	2	3	4	5
Elapsed Time (in-flight hourmeter reading minus take-off hourmeter reading)					
lbs of Fuel Consumed (elapsed time x 93 lb/hr)					
Weight onboard (take-off weight onboard minus fuel consumed)					
Test Longitudinal Center of Gravity					
Chart % RPM					
Test % RPM (from in-flight data)					
RPM Correction (chart % RPM minus Test % RPM)					

* Chart Instructions:

a. Start at outside air temperature, and draw a vertical line up to pressure altitude.
b. Draw a horizontal line from pressure altitude to weight onboard at time of autorotation.
c. Draw a vertical line down from weight onboard to required auto RPM.

Note: Increase rotor RPM 0.75% for every inch that CG is forward of FS 100.0.

4. Adjust pitch links based on average RPM correction required. Lengthen both pitch links equally to decrease RPM if test RPM is greater than chart RPM; shorten both pitch links equally to increase RPM. One full turn of D173-3 rod end will change RPM approximately 3½%. Adjust both pitch links exactly the same so track will not be affected.

5. Repeat steps 1 thru 4 as required until the RPM correction is ± 1% of chart RPM.

R44 Autorotation RPM

COLLECTIVE FULL DOWN
50 KIAS

Refer to § 10.232 for pitch link adjustment.

One full turn of barrel or link assembly = approximately 3% RPM change

One full turn of D173-3 rod end = approximately 3½% RPM change

NOTE

Increase Rotor RPM 0.75% for every inch that CG is forward of FS 100.0.

Example: OAT = 20°C, Hp = 2000 ft, Weight on board = 300 lb, CG = FS 98.0
Target RPM = 99% + (2 x 0.75%) = 100.5%

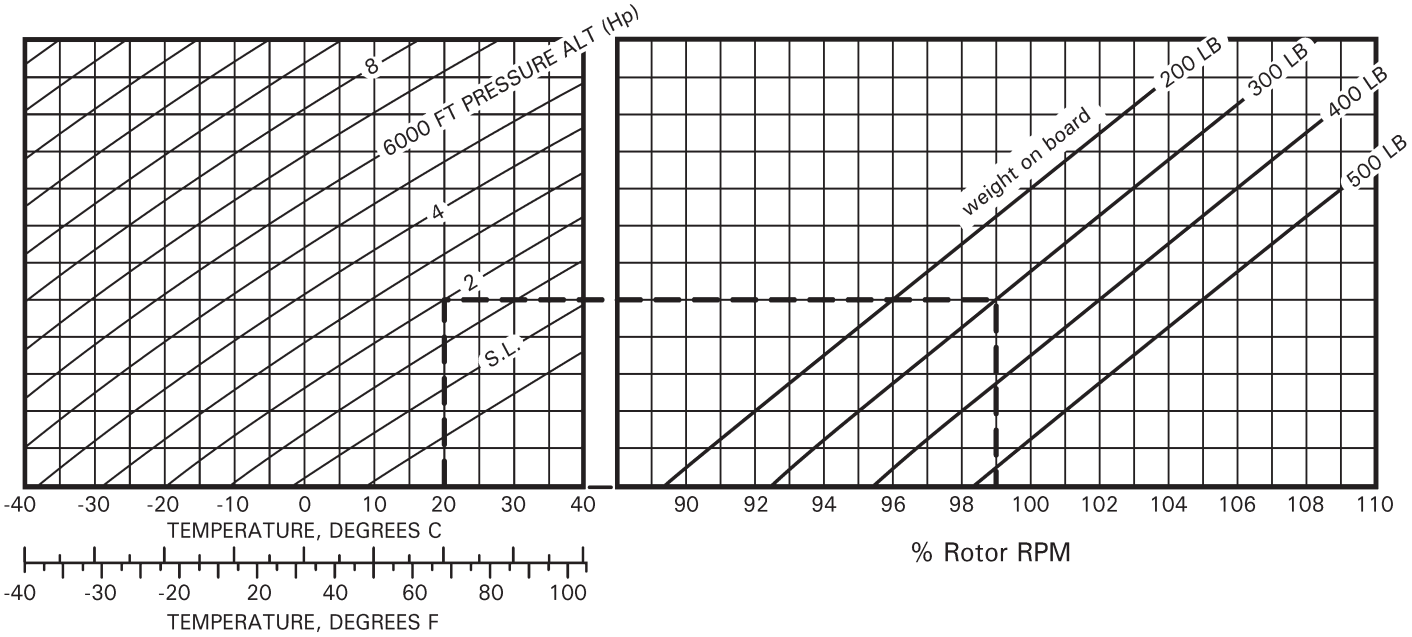

FIGURE 10-17 R44 AUTOROTATION RPM

Intentionally Blank

15.600 Emergency Equipment

15.610 Emergency Locator Transmitter (ELT)

A. Description

The ELT activates when subjected to a significant change in velocity (as in a crash), by remote control switch located on the cyclic control panel, or by a switch on the ELT transmitter. Refer to § 37-90 for system description.

Refer to Kannad Aviation AF Integra / AF-H Integra or 406 AF-Compact/406 AF-Compact (ER) ELT Installation and Operation Manual for maintenance requirements and procedures.

Register an ELT when first purchased, when contact information changes, or when aircraft ownership, or tail number changes. Registration information is available online at: www.cospas-sarsat.org.

Dongles contain a memory chip that must be programmed with aircraft-specific information prior to installation for the ELT to function. The dongle may be removed and shipped to RHC or a Kannad Service Center for reprogramming. Kannad Aviation's Programming Data Sheet is available online at: https://robinsonheli.com.

B. Transmitter

Removal

1. Release D693-4 strap assembly or B359-2 (reusable) ty-rap.
2. Release Velcro strap; disconnect dongle and antenna wiring from transmitter at connectors and remove transmitter.

Installation

1. Connect dongle and antenna wiring to transmitter at connectors. Verify security.
2. Position transmitter on mounting bracket and secure with Velcro strap. Secure D693-4 strap assembly or install B359-2 (reusable) ty-rap around transmitter and bracket. Verify security.

C. Dongle

Removal

Cut and discard ty-raps as required, disconnect dongle from transmitter and airframe harness at connectors, and remove dongle.

Installation

1. Connect programmed dongle to transmitter and airframe harness at connectors.
2. Install ty-raps as required. Cinch ty-raps until snug without over-tightening, and trim tips flush with heads. Verify security.

15.620 Fire Extinguisher

CAUTION

Fire extinguisher operating and storage temperature range is -40°F to 120°F (-40°C to 49°C). If conditions expose extinguisher to temperatures outside this range (e.g. long-term parking in direct sunlight in hot climates), remove extinguisher from helicopter and store it within the specified temperature range.

A. Inspection

Every 12 months: Remove B381-1 or B381-4 fire extinguisher from helicopter. Visually inspect extinguisher for damage or corrosion and ensure nozzle is unobstructed and tamper seal is intact. Ensure G654-15 or G654-23 decal (maintenance log) is legible; replace decal if required. Measure extinguisher weight using a 1-gram resolution (or better) scale and record weight on maintenance log; remove extinguisher from service if total weight falls below minimum allowable weight specified on decal.

Every 12 years: Remove B381-1 fire extinguisher from service at end of 12th year from date of manufacture (labeled on bottom).

B. Bracket Removal

1. Unlatch fire extinguisher bracket and remove extinguisher.
2. Remove hardware securing bracket to cabin and remove bracket.

C. Bracket Installation

1. Install hardware securing fire extinguisher bracket to cabin. If installing bracket to chin, select screw length as required to provide 0.00–0.06 inch thread exposure. Verify security.
2. Position fire extinguisher on mounting bracket and latch bracket.

D. Strap and Pocket Assembly Replacement

1. Detach strap assembly from pocket assembly, and detach pocket assembly straps via hook and loop tape. Remove fire extinguisher.
2. As required, open upper console. If installed, remove hardware securing HID landing light left ballast to left console and secure ballast away from workspace.
3. Drill out rivets securing strap assembly and pocket assembly to cabin or console and remove strap and pocket. Deburr holes and clean up debris.
4. Cleco new strap assembly and pocket assembly to cabin or console. Progressively remove clecos and install washers and rivets. Verify security.
5. If removed, install hardware securing HID landing light left ballast to left console. Verify security. If opened, close upper console.
6. Install fire extinguisher and attach pocket assembly straps around extinguisher via hook and loop tape. Route strap assembly through extinguisher head and attach to pocket assembly via hook and loop tape. Verify security.

23-33 Special Torques (continued)

AREA	(QUANTITY) FASTENER	TORQUE
MAIN ROTOR GEARBOX (continued)	(6) NAS1352-4H16P screws, sump-to-housing (safety wire is required)	120 in.-lb at head
	(6) NAS1352-4-16 screws, sump-to-housing (safety wire not required)	140 in.-lb at head
MAIN ROTOR HUB	(1) NAS634-105 bolt, teeter hinge and (2) NAS634-105 bolts, coning hinges **WARNING** **Scrap bolt & nut if bolt is elongated more than 0.024 inch during tightening.**	New bolt: 0.021–0.022 inch elongation, wet with A257-9 Used bolt: 0.020–0.022 inch elongation, wet with A257-9, and cotter pin holes must align
PITCH LINKS	21FKF-813 or 27FKF-813 self-locking jam nut, main rotor pitch link	300 in.-lb
POWERPLANT	(4) bolts, air box-to-carburetor	30 in.-lb
	(2) bolts, engine-to-ground strap	96 in.-lb
	(6) bolts, D730-1 manifold weldment-to-engine	96 in.-lb
	(4) engine hardware, securing C592-3 mount assembly or C174-11 plate weldment to crankcase prop-governor pad	204 in.-lb
	(1) D210-8 nut securing C592-4 mount assy to support weldment	400 in.-lb
	(6) engine nuts, securing C357-1 clips	96 in.-lb
	(1) hardware, securing alternator to B200-3 or D728-1 arm	204 in.-lb
	(4) nuts, carburetor-to-engine (O-540)	96 in.-lb initial, 204 in.-lb final; torque in crisscross pattern
	(1) nut, A457-9 tee	140 in.-lb
	(1) nut, A462 fitting on mixture control arm	27 in.-lb
	(12) spark plugs	420 in.-lb wet with A257-16
	(1) A058-10 probe	36–48 in.-lb
	(1) A723-15 line assembly, nuts	40 ft-lb
	(1) B173 v-belt, tension at alternator	150–170 in.-lb initial drag at pulley
	(1) B283-7 hose assembly, nuts	140 in.-lb
	(1) B283-10 hose assembly, nuts	140 in.-lb
	(1) B283-11 hose assembly, nuts	140 in.-lb
	(1) C740-4 line assembly, nuts	30 in.-lb
	(1) D740-1 line assembly, nuts	30 in.-lb
	(1) D753-1 line assembly, nuts	40 ft-lb
	(1) D753-2 line assembly, nuts	40 ft-lb
	(2) MS20074-05-04 bolt, alternator	204 in.-lb
	(1) MS20074-05-11 bolt, alternator	204 in.-lb
	(1) MS20074-06-07 bolt, alternator	280 in.-lb

23-33 Special Torques (continued)

AREA	(QUANTITY) FASTENER	TORQUE
POWERPLANT (continued)	(4) NAS1352-6H48P screw, securing C593-3 mount assy	280 in.-lb
	(3) STD-1411 nuts, securing C357-3 clips	96 in.-lb
	(12) 21FKF-518 nuts, exhaust flange (draw up evenly prior to torquing)	200–220 in.-lb
	(1) 3080-38 cylinder head temperature probe (1-wire)	75 in.-lb
	(1) A760-2 cylinder head temperature probe (3-wire)	50 in.-lb
PRIMER SYSTEM (See also FUEL SYSTEM)	(1) D101-3, (1) D102-4, (2) D103-3, (1) D104-3, (1) D105-3, (1) D106-3, and (1) D107-3 line assembly, nuts	20–30 in.-lb
	(1) AN894D4-2 Bushing, at gasoclator	50–65 in.-lb
	(1) AN894D6-4 Bushing, at gasoclator	110–130 in.-lb
STEEL TUBE FRAME	(2) C722-2 5/8-inch internal-wrenching screws	120–125 ft-lb wet with A257-9
	(2) S14119 screw and (2) A31007 nut	10 in.-lb
SWASHPLATE	(18) AN503-8-8 fillister-head screws	17 in.-lb
	(26) NAS1352-08H8P socket-head screws	30 in.-lb
	(26) NAS1352N08-8 screws	35 in.-lb wet with A257-9
TAIL ROTOR	(1) NAS6606-53 bolt, elastomeric teeter (delta) hinge	420 in.-lb
TAIL ROTOR GEARBOX	(1) A610-1 vent assembly	100 in.-lb
	(1) B563-4 sight gage	150 in.-lb
	(1) B566-2 chip detector	100 in.-lb
	(1) D210-4 nut, securing C119-2 bumper to TRGB output shaft	120 in.-lb
	(1) D210-5 nut, pitch control housing stud	240 in.-lb
	(1) AN320-8 nut, C116-1 input yoke	35–45 ft-lb
	(4) MS20074-04-06 bolts, input cap	60 in.-lb
	(8) MS20074-04-06 bolts, input cartridge and output cap	100 in.-lb
	(4) NAS1352-5H12P drilled-head bolts, gearbox-to-tailcone attaching	200 in.-lb
	(4) NAS1352-5-12P bolts (undrilled), gearbox-to-tailcone attaching	240 in.-lb
WINDSHIELD	(22) AN526C832R12 screw, thru center brace	16 in.-lb
	(66) B526-6 screw, polycarbonate windshield	24 in.-lb

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13.38	DEC 2021
14.i	JUL 2021

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14.3H	JUN 2014
14.3I	JUN 2014
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14.18A	OCT 2006
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14.20D	15 Jun 98
14.20E	JUL 2004
14.20F	18 MAR 99
14.20G	JUL 2004
14.20H	JUL 2004
14.20I	DEC 2011
14.20J	DEC 2011
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14.20L	JUN 2014
14.20M	JUN 2014
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15.9	JAN 2021

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