Manual: CSP-HMI-2, Handbook of Maintenance Instructions
Models: 369D/E/FF - 500/600N Helicopters
Issued: 31 October 1990
Revision 36: 11 November 2004

FILING INSTRUCTIONS:

(1) Before inserting this change, ensure the manual is current.
Check the existing List of Effective Pages in the manual to ensure all prior revisions are inserted.
(Do not insert this revision if prior revisions are not inserted).

(2) Incorporate this change by removing old pages and inserting new pages as indicated below.

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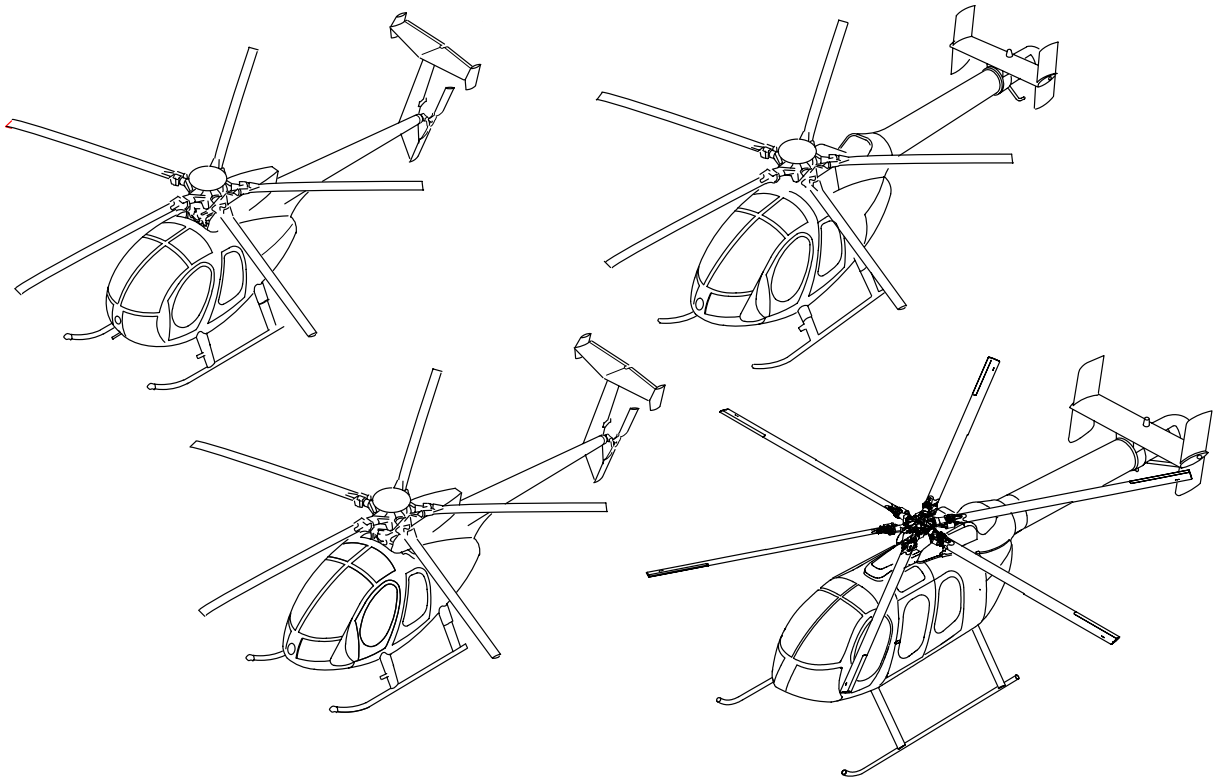
MDHI MODEL HELICOPTERS

MODELS 369D/E/FF – 500/600N

Basic Handbook of Maintenance Instructions

(CSP–HMI–2)

SERVICING AND MAINTENANCE



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Issued: 31 October 1990
Revision No. 36: 11 November 2004

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MD Helicopters, Inc.
4555 East McDowell Road
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MD HELICOPTERS INC.

RECORD OF TEMPORARY REVISIONS

MANUAL TITLE: CSP-HMI-2 MAINTENANCE MANUAL

REV. NO.	DATE INSERTED	BY	DATE REMOVED	BY	REV. NO.	DATE INSERTED	BY	DATE REMOVED	BY
02–001			Removed by						
and			Incorporating						
02–002			Revision 32						
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LIST OF EFFECTIVE PAGES

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Revision 2 . . . . . 10 May 1991
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Table 1. ACTIVE SERVICE BULLETINS (Cont.)

369D	369E	369F	500N	600N	SUBJECT	DATE
				013R1	Low Fuel Level Warning Light	4–15–98
	090R1	077R1	017R1	014R1	Socket Contact Assembly Inspection	9–25–98
				015	Engine Fuel Control Box Replacement	4–23–99
				016R1	Audio Warning System Replacement	9–19–00
				017	FADEC Manual Switch Guard Modification	10–6–98
				018R1	Torque Pressure Transducer High Intensity Radiated Fields (HIRF) Protection Modification	2–7–00
				019	FADEC Wire Harness Standoff Installation/Inspection	4–23–99
				020R2	Electromagnetic Compatability Test (EMC) for Optional Equipment Effects on the FADEC Control	4–14–03
				021R1	Inspection/Reidentification/Serialization of Cyclic Control Stick Sockets and Left Hand Command (Co–Pilot) Cyclic Tube	3–11–99
197	091		018		Engine Fuel Pressure Switch Replacement	2–23–99
198	092				Tail Rotor Fork Inspection, Four–Bladed	5–10–99
				022	Torque Transducer Replacement	4–23–99
				023R1	Cyclic Stick Replacement	7–30–99
				024R1	Link Assembly Replacement	4–6–99
				025	Fuel System Inspection	7–2–99
199	093		019		Turbine Outlet Temperature (TOT) Indicating System, One Time Inspection	1–11–00
				026	Turbine Outlet Temperature (TOT) Indicating System, One Time Inspection	1–11–00
			020R2	027R2	Forward and Center Thruster Control Cables, Conduit Cap Relief Area, Inspection	4–24–00
			021	028	Forward and Center Thruster Cables, Conduit Cap at Telescopic Swivel End, Inspection	11–19–99
200	094	078	022		Landing Gear Strut Inspection and Fairing Modification	4–7–00
				029	Motive Flow Restrictor Removal	1–10–01
				030R1	Inspection of Vertical Stabilizer and Torque Tube and Replacement of Attaching Hardware	5–25–01
201R2	095R2	079R2	023R2	031R2	Main Rotor Blade Torque Event Inspection	2–04–04
				032	Turbine Outlet Temperature (TOT) Indicator Replacement	12–13–01
				033	Main Rotor Drive Shaft Life Reduction	12–13–01
				034	Torque Transducer Electrical Connector One Time Inspection	12–13–01
			024	035	Fan Pitch Control Aft Tube Assembly One Time Inspection	10–23–01
				036	Tailboom Assembly Attach Fitting One Time Inspection and Repair	11–2–01
202	096	080	025	037	Main Transmission Bonding Jumper Inspection and Rework	8–14–02
				038	Exhaust Duct Inspection	5–6–03
		081			Minimum N1 Starting Speed Decal/Placard Installation	7–22–03
				039	Tailboom Attach Fittings and Upper Longerons Inspection	12–9–03
				040	Control Support Bracket Assembly Life Reduction with YSAS Installed	12–19–03
			026	041	Tailboom Assembly Overlap Inspection and Rework	11–26–03
			027	042	Forward and Center Thruster Cable Assemblies Connector One–Time Inspection	5–03–04

4. Cancelled or Superceded Service Information Notices

(1). Table 2 a list of Service Information Notices that have been cancelled or superceded.

(2). Updated information, pertinent to the Notice, has been incorporated into the appropriate manuals.

(3). If the Notice is superceded by another Notice, it will be noted in the Subject column after the description.

5. Scope

The following is an explanation of how to read Table 2.

(1). **DN**-369D Model Helicopters
EN-369E Model Helicopters
FN-369F and 369FF Model Helicopters
NN-500N Model Helicopters.

(2). **Subject** - A brief description of the Notice.

(3). **Date** - Date the Notice was cancelled or superceded.

Table 2. CANCELLED OR SUPERCEDED SERVICE INFORMATION NOTICES

369D	369E	369F	500N	600N	SUBJECT	DATE
2.3					Main Rotor Strap Pack Lamination Inspection (Superceded by DN–154)	1–15–88
4.1					Main Rotor Blade Phasing, Tracking and Balancing	8–2–93
5					600–Hour Periodic Inspection – Model 369D Cyclic Control System	8–2–93
7					Installation of 369D21008 Main Rotor Pitch Control Rod Assembly, Upper and Lower Rod End Bearings	8–2–93
15					Periodic Inspection of 369D26300 and 369D26301 Landing Gear Damper Assemblies	8–2–93
28					Field Modification of 369D29919 Main Rotor Blade Phasing Kit to new 369D29919–501 Configuration	8–2–93
29.3					Periodic Replacement of 369H5655–3 and –5 Oil Cooler Blower Fan Bearings; Inspection of Pulley Attach Hardware and Driveshaft Couplings; Inspection and Adjustment of Fan Drive Belt; Driveshaft Compression Check	8–2–93
32					New Periodic Inspection Intervals – Battery Overtemperature Warning System	8–2–93
33.1					Replacement of 369A1602 Tail Rotor Drive Fork Hinge Bolt and 369A1603 Nut; New Assembly Procedure for Tail Rotor Hub and Drive Fork Unit; Periodic Check of Flapping Hinge Bolt Preload	8–2–93
38					Daily Inspection of 369H5307 Tail Rotor Stop and 369D21724–3 Support	8–2–93
41.1					Operational Check of Engine Fuel Pump Filter Pressure (Bypass) Switch Assembly	8–2–93
	2				Inspection of Spare Main Rotor Blade Root Fitting Assemblies; Inspection of Main Rotor Hub Lead–Lag Link Assemblies (Superceded by EN–42)	11–13–87
		2			Inspection of Main Rotor Hub Lead–Lag Link Assemblies (Superceded by FN–31)	11–13–87
53.1					100–Hour Periodic Inspection of Fuel Tank Sending Unit and Fuel Low Warning Light Indicating System	8–2–93
57					Field Repair of 369D21300 Pitch Housing Assembly, Main Rotor Hub	8–2–93
61.2					Periodic Check of 369D21400–502 and M50452 Main Rotor Elastomeric Damper Assemblies	8–2–93
64					Pilot/Operator Check of 369D21210–501 Main Rotor Hub Strap Pack Assembly (Superseded by DN–154)	1–15–88
74					Un–Assigned	
75.1					Procedure for Installation of Tail Rotor Drive Shaft (Superceded by DN–95)	9–27–82
77.1					Main Rotor Strap Pack Lamination Inspection (Superceded by DN–154)	1–15–88

Table 202. Optional Equipment List

Nomenclature	Part Number	369D	369E	369FF	500N	600N
10 – PARKING AND MOORING						
M/R blade stowage rack	369D299913	X	X	X		
21 – ENVIRONMENTAL CONTROL SYSTEM						
Heating system	369H90020	X	X	X	X	X
25 – EQUIPMENT / FURNISHINGS						
Seat assy. passenger compartment	369D290037	X				
Litter kit (bubble doors and flat glass)	369H90011–519	X	X			
Litter kit (W/O doors)	369H90011–521	X	X			
Seat and belts (four on the floor)	369H90035	X	X	X	X	
Seat (mesh)	369H90040	X	X	X	X	
Hoist	369H90070	X	X	X	X	
Cargo hook	369H90072	X	X	X	X	X
Seat belt assembly (pilot, co–pilot)	369H6541	X				
Shoulder harness and seat belt inertia reel	421–099		X	X	X	
Litter kit	369D290170	X	X			
Litter kit	TA–HH–0001	X	X	X		
Forward equipment tray	369D292200		X	X	X	
26 – FIRE PROTECTION						
Fire extinguisher	369H90001	X	X	X	X	X
28 – FUEL SYSTEM						
Anti–ice fuel filter	369H90022	X	X		X	
Airframe fuel filter	600N98110					X
Fuel tank, self–sealing	369H90029	X	X	X	X	
Drain, auxiliary engine fuel filter	369H92255	X				
32 – LANDING GEAR						
Extended landing gear	369D290007	X	X	X	X	
Extended landing gear	600N6000					X
Step assembly, extended landing gear	600N6501					X
Utility floats	369D290086	X	X			
Emergency floats	369D290121	X	X	X	X	
Ground handling wheels (pneumatic)	369H90045	X	X	X	X	
Ground handling wheels (compact)	369H90126	X	X	X	X	
Float lamp assembly	369D292032	X	X		X	X
Landing gear kit, winterized	369D290010	X	X	X	X	
Landing gear kit, mid–temp	369D290012	X	X	X	X	
Metal landing gear fairings	SA4344				X	

Table 202. Optional Equipment List (Cont)

Nomenclature	Part Number	369D	369E	369FF	500N	600N
52 – DOORS						
Door (litter)	369H90085	X				
53 – FUSELAGE						
Magnesium–to–aluminum conversion kit	M30251–501	X	X	X	X	
Clear windshield kit	369H90026	X				
Comfort window	369D290026		X	X	X	
Side window (fwd extended canopy)	369D292491		X	X		
Upper and lower windshield (Heliplex)	SH7443SW		X	X	X	
Window, crew (Heliplex)	SH7404SW		X	X	X	
Window, passenger (Heliplex)	SH7405SW		X	X	X	
63 – TRANSMISSION AND DRIVE SYSTEM						
M/R transmission oil cooler drain	369D290120	X				
Rotor brake	369H90123	X	X	X	X	X
64 – ANTI–TORQUE ASSEMBLY						
4–Bladed tail rotor drive system	369D292500	X	X			
67 – FLIGHT CONTROLS						
Dual controls, L/H command	369H90033	X	X	X	X	X
Cyclic stick grip kit	369H90129	X	X	X	X	
Right hand command kit	369D297001	X	X	X	X	X
Yaw Stability Augmentation System	600N97300					X
71 – POWER PLANT						
Engine air inlet deflector kit	369D292044	X	X			
Mist eliminator access panel	369D290270	X	X	X		
Foriegn particle diverter kit	369D292045	X	X			
250–C20R/2 conversion kit	369D298000	X	X			
Particle separator	369H90148	X	X	X	X	
Particle separator filter Particle separator Particle separator fairing	600N90148 600N90125 600N90128					X X X
Engine compressor water wash kit	369H92537	X	X	X	X	X
Mist eliminator	369D290125				X	
C30 maintenance fuel pump kit	369D298100			X	X	
Starter–Generator cooling system A1400–185	SH907GL				X	
95 – INSTRUMENTS						
IVSI	369D294508		X	X	X	
Heated pitot tube	369H90034	X	X	X	X	
Heated pitot tube	600N90034					X

Table 202. Optional Equipment List (Cont)

Nomenclature	Part Number	369D	369E	369FF	500N	600N
Attitude gyro indicator	369H90038	X	X	X	X	
AIM attitude gyro (510–1BL)	600N96501					X
Directional gyro indicator	369H90039	X	X	X	X	
AIM 200 directional gyro (200DCL)	600N96502					X
AIM 205 directional gyro (205–1BL)	600N96503					X
Instantaneous vertical speed indicator	369H90044	X	X	X		
Vertical speed indicator	600N96523					X
Instantaneous vertical speed indicator	600N96524					X
Auto direction finder (KR–85)	369H90067	X				
Auto direction finder (Collins ADF–650A)	369D24165		X	X		
Auto direction finder (KR–87)	600N96508					X
Compass system (KCS–55A)	600N96528					X
Altimeter indicator (millibar scale)	369H90124	X	X	X		
Radar altimeter	600N96506					X
Encoding altimeter (United 5035)	600N96522					X
AIM turn/bank indicator (TS400–1AL)	600N96504					X
Digital/Analog TOT indicator	369D294509	X	X		X	
96 – ELECTRICAL POWER						
17AH ni–cad battery	369D290011	X	X		X	X
Dual–starting kit	M30306	X				
FWD battery	369D222505		X			
13AH ni–cad battery	369D24296		X			
97 – AVIONICS						
Transponder, Mode S (KT–70)	600N96509					X
Transponder (KT–76A)	369H90073	X				
Transponder (King KT–76A)	369D24163		X	X		
Transponder (Collins TDR–950)	369H90009	X				
Transponder (Collins TDR–950)	369D24166		X	X		
Transponder, Mode A/C (KT–76A)	600N96511					X
GPS International (KLN 90B)	600N96507					X
NAV/COM (Collins)	369H90007	X				
NAV/COM transceiver (KX–170A)	369H90071	X				
NAV/COM transceiver (KX155)	369D24147		X	X		
NAV/COM transceiver (KX155)	600N96512					X
NAV/COM transceiver (King KX–1756)	369D24162		X	X		
NAV/COM (Collins VHF–251 and VIR–351)	369D24164		X	X		
Transceiver (VHF–22B)	369D24322		X			

Table 202. Optional Equipment List (Cont)

Nomenclature	Part Number	369D	369E	369FF	500N	600N
Comm. receiver (Bendix/King KY–196)	369D24167		X	X		
Comm. receiver (KY196A–30)	600N96513					X
ADF (Collins RCR–650)	369H90008	X				
ADF (King KR–87)	369D24161		X	X		
ADF (Collins 60A)	369D24333		X			
ICS system	369H90068	X				
ICS system	369D24118		X	X	X	X
NAT AA82/AA83 stereo ICS	600N96505					X
Copilot foot switch	600N96526					X
Rear seat transmit switch	600N96527					X
Radio (ASB/125/60)	369H90144	X				
Headset, microphone assembly	369H92042	X	X	X	X	
Switch and jack assembly, intercom	369H92492	X	X	X	X	
Headset microphone	H10–56	X	X	X	X	
Harness assembly (VHF–22B)	369D24321		X			
Instrument and electrical (R/H command)	369D24175				X	
Sterio audio control	600N96529					X
Audio control panel (KMA24–H)	600N96514					X
Middle seat wire harness	600N96515					X
Collective Hobbs	600N96525					X

AIRWORTHINESS LIMITATIONS

Type Certificate No. H3WE

FAA Approved Airworthiness Limitations for MD Helicopters, Inc., Models 369D/E/F/FF and 500/600N.

1. General

The Airworthiness Limitations section is FAA approved and specifies maintenance required under Code of Federal Regulations (CFR), Title 14, Federal Aviation Regulation (FAR), Part 43.16 and 91.403 unless an alternative program has been FAA approved.

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TR 91–001	August 12, 1991	8/14/91
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TR 91–002	November 5, 1991	11/7/91
Revision 4:	January 20, 1992	01/16/92
TR 92–004	May 20, 1992	5/27/92
Revision 5:	August 24, 1992	08/19/92
TR 92–005	November 20, 1992	11/12/92
Revision 6:	December 21, 1992	12/4/92
Revision 7:	June 1, 1993	Section 04–00–00 Not Affected This Revision
TR 93–002	May 27, 1993	5/27/93
Revision 8:	July 23, 1993	7/13/93
TR 94–001	January 21, 1994	02/09/94
Revision 9:	April 22, 1994	3-29-94 ACTING CHIEF
Revision 10:	September 26, 1994	Section 04–00–00 Not Affected This Revision
TR 94–002	October 24, 1994	10/24/94

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Revision 11:	January 18, 1995	01/23/95
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TR 96–002:	April 24, 1996	04/24/96
Revision 13:	May 31, 1996	6/12/96
Revision 14:	September 13, 1996	09/09/96
Revision 15:	November 15, 1996	Section 04–00–00 Not Affected This Revision
Revision 16:	January 6, 1997	Section 04–00–00 Not Affected This Revision
Revision 17:	February 24, 1997	02/20/97
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TR 97–002:	August 19, 1997	08/19/97
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Revision 19:	December 16, 1997	12/19/97
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Revision 24:	7 December 1999	12/30/99
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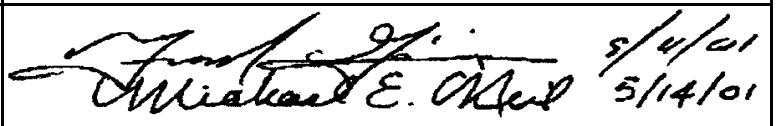
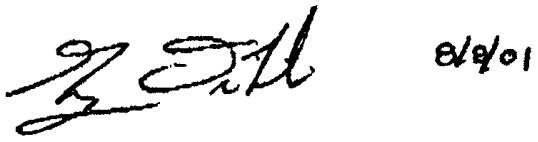
Revision 29:	11 May 2001	 5/4/01 5/14/01
Revision 30:	11 July 2001	Section 04–00–00 Not Affected This Revision
TR 01–001:	10 August 2001	 8/8/01
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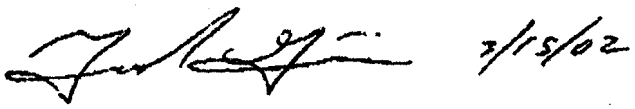
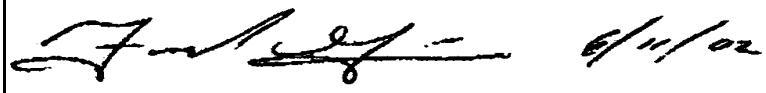
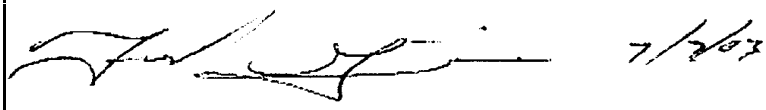
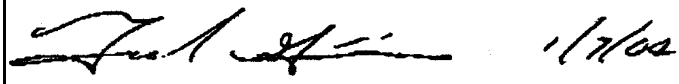
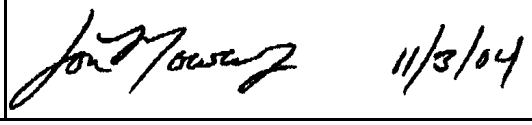
TR 02–002:	30 January 2002	 1/23/02
Revision 32:	18 March 2002	 3/15/02
Revision 33:	24 June 2002	 6/11/02
TR 03–001:	18 June 2003	 6/13/03
TR 03–002:	25 June 2003	 7/7/03
Revision 34:	21 July 2003	Section 04–00–00 Not Affected This Revision T/R 03–001 and 03–002 Previously Signed
TR 03–003:	30 September 2003	 12/3/03
TR 03–004:	17 December 2003	 1/7/04
Revision 35:	20 May 2004	Section 04–00–00 Not Affected This Revision T/R 03–003 and 03–004 Previously Signed
TR 04–001:	28 May 2004	 6/7/04
Revision 36:	11 November 2004	 11/3/04

This document conforms to Main Rotor Stress Analysis 369D/E, Rev. U.
This document conforms to Stress Analysis 369FF, Rev. R.
This document conforms to Service Life Analysis 500N, Rev. T.
This document conforms to Service Life Analysis 600N, Rev. Y.

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AIRWORTHINESS LIMITATIONS

2. Component Mandatory Replacement

The Airworthiness Limitation Replacement Schedule specifies the mandatory replacement time, structural inspection interval and related structural inspection procedures approved per the certificate basis of the Type Certificate Data Sheet No. H3WE and CAR 6 (6.250, 6.251) and CFR 27.571 for models 500/600N unique components only. At the listed finite-life, components or assemblies must be removed from the helicopter and permanently retired from service. At the listed inspection interval, the components or assemblies must be inspected in accordance with the Handbook of Maintenance Instructions (HMI). The title of the task and section of the HMI are referred to which provide the inspection procedures and criteria.

NOTE: Refer to CFR Part 43.10 for latest requirements for the removal, installation, storage and disposition of life-limited parts.

(1). A "life-limited" part is a physical component of the helicopter to which a maximum number of allowable operating hours or cycles are assigned. Certain assemblies and components on the helicopter have a limited life established by MDHI and approved by FAA Engineering. For example, a part with an assigned limit of 1000 hours, may accumulate 1000 hours of operation in service. Upon completion of the 1000 hours of operation, useful life of the part is ended. The finite-life assigned to different parts varies according to engineering fatigue tests, part experience, etc. The parts listed in this section must be removed from the helicopter at the finite-life indicated and identified as to it's expired life (Ref, Table 1, Note (1)).

(2). All parts not having an assigned life or stated to be of unlimited life, have a life of not less than 20,000 hours.

(3). When a life-limited part or an assembly that incorporates a life-limited part is installed on a new or used helicopter, the nomenclature, part number, serial number, component time and current helicopter hours are recorded in the Log Book and component log for the helicopter. Whether the life-limited part is new or used, the remaining number of useful life hours and previous inspection time, if applicable, for the part is added to the existing helicopter time. The total helicopter hours obtained then denotes the subsequent time at which the part must be removed from the helicopter or inspected.

(4). If a life-limited part, is part of an assembly, the assembly must be removed from the helicopter when the time expires. The assembly may be overhauled and restored to maximum number of hours of useful life by installing new life-limited parts plus all other parts specified in the overhaul instructions (Refer to Component Overhaul Manual).

(5). If interchanged between different model helicopters (for instance, Model 369D to 369FF or vice versa), any component having a limited life or overhaul schedule must be restricted to the lowest service life or TBO schedule indicated for the helicopter models and serial numbers affected.

(6). Refer to the appropriate Allison Operation and Maintenance Manual for engine component replacement requirements.

3. Component Mandatory Inspections

Some components with mandatory inspection intervals require inspections to be completed in accordance with procedures detailed in other sections of this maintenance manual. The appropriate inspection procedures are referenced in the **Notes** flagged to each component to be inspected. All maintenance manual procedures which are referenced in the FAA Approved Airworthiness Limitations Component Mandatory Replacement Schedule are FAA approved procedures which cannot be changed without FAA review and approval of the proposed changes.

4. Retirement Index Number (RIN)

(1). A Retirement Index Number (RIN) is a number that accounts for different usage spectra in assigning the retirement time for a component.

The RIN is calculated as the sum of an adjustment factor times flight hours plus another adjustment factor times Torque Events.

When a component reaches 1,000,000 RIN's, it has reached it's maximum life and is to be scrapped.

5. Torque Event (TE)

A Torque Event (TE) is defined as:

The transition to a hover from forward flight.

Any external lift operation.

NOTE: An external lift can either be on the cargo hook, external hoist or in external baskets.

For external lift operators, an external load is recorded as two (2) TE's (pick-up and drop-off).

Hover taxi with no external load will typically result in no TEs.

6. External Lift and Torque Event (TE) Requirements

The 369D/E/F/FF - 500/600N helicopters are multi-use helicopters. If the helicopter is used primarily for external lifts or training flights (high TE flights), there may be a reduction in inspection intervals of some components.

CAUTION For safe operation of the helicopter, TE's must be recorded in the Rotorcraft Log Book. Each external lift will be recorded as two (2) TE's.

(1). Determine the number of TE's and external lifts the helicopter accumulates per hour of flight time.

(2). Record all TE's in Rotorcraft Log Book and continue to record all TE's.

(3). Perform required TE inspections.

Table 1. Airworthiness Limitations Schedule

Component (1)	Model	Part Number (2)	Finite Life Hours (1)	Mandatory Inspection Hours
Main Rotor System				
Blade assembly, main rotor	369D/E(5)(6)	369D21100	3530 (37)	25 (11)(20)
		369D21100–516	3530 (37)	100 (20)
		369D21100–517	2500 (31)	25 (22)
		369D21100–517	3530 (37)	100 (20)
		369D21100–523	4000 (37)	100 (20)
		369D21120–501	3530 (37)	100 (20)
		369D21120–503	3530 (37)	100 (20)
	369F/FF (6)	369D21102	3430 (37)	25 (11)(20)
		369D21102–503	3430 (37)	100 (20)
		369D21102–517	2500 (31)	25 (22)
		369D21102–517	3430 (37)	100 (20)
		369D21102–523	4000 (37)	100 (20)
		369D21121–501	3430 (37)	100 (20)
		369D21121–503	3430 (37)	100 (20)
	500N (6)	369D21102–503	3430 (37)	100 (20)
		369D21102–517	2500 (31)	25 (22)
		369D21102–517	3430 (37)	100 (20)
		369D21102–523	4000 (37)	100 (20)
		369D21121–501	3430 (37)	100 (20)
		369D21121–503	3430 (37)	100 (20)
	600N (6)	369D21102–517 (21)	1900 (32)(37)	100 (20)
		369D21102–523	3200 (33)(37)	100 (20)
		369D21121–501	3200 (33)(37)	100 (20)
		369D21121–503	3200 (33)(37)	100 (20)
Folding pin, main rotor blade attach	369D/E/F/FF	369A1004	2850	
		369A1004–3	2850	
		369A1004–5	7600	
	500/600N	369A1004–5	7600	
Hub subassembly, main rotor	369D/E/F/FF 500N	369D21201	8900	
Pitch housing assembly, main rotor hub	369D	369D21300	9100	
		369D21300–501	9100	
	369E/F/FF 500N	369D21300–501	9100	

Table 1. Airworthiness Limitations Schedule (Cont.)

Component (1)	Model	Part Number (2)	Finite Life Hours (1)	Mandatory Inspection Hours
Retention strap assembly, main rotor hub	369D	369D21210	2770	100 (4)
		369D21210–501	2770	100 (4)
	369E/F/FF	369D21210–501	2770	100 (4)
	500/600N	369D21210–501	2770	100 (4)
Bolt – lead–lag hub, main rotor	369D	369A1220	6120	
	369D/E/F/FF 500N	369D21220	6120	
	600N	369D21220	5400 (34)	
Link assembly – lead lag hub, main rotor	369D/E	369H1203–BSC (39)	5762	25 (23)
		369H1203–21 (39)	5762	25 (23)
		369H1203–31 (39)	5762	25 (11)
		369H1203–51 (39)	11080	
		369H1203–53 (40)	11080	
		369H1203–61 (39)	11080	
	369F/FF	369H1203–21 (39)	5762	25 (23)
		369H1203–31 (39)	5762	25 (11)
		369H1203–51 (39)	11080	
		369H1203–53 (40)	11080	
		369H1203–61 (39)	11080	
	500N	369H1203–51 (39)	11080	
		369H1203–53 (40)	11080	
		369H1203–61 (39)	11080	
	600N	369H1203–51 (39)	11080	
		369H1203–53 (40)	11080	
Lead lag damper – main rotor	369D	369D21400–501	6060	
		M50452	On Cond.	(16)
	369D/E/F/FF 500/600N	369D21400–503	On Cond.	(16)
Drive shaft, main rotor	369D/E	369D25510	5020	300 (8)
	369F/FF	369D25510	3675	300 (8)
	500N	369D25510–21	3260	300 (15)
	369D/E	369F5510	5020	
	369F/FF	369F5510	3675	
	500N	369F5510	3260	
	600N	600N5510	14000 (35)	
Mast assembly, main rotor	369D/E/F/FF 500N	369D22014	10450	
	600N	369D22014	3500	
Drive Shafts, Couplings and Clutches				
Drive shaft, main rotor transmission	369D/E/F	369A5510	3790	

Table 1. Airworthiness Limitations Schedule (Cont.)

Component (1)	Model	Part Number (2)	Finite Life Hours (1)	Mandatory Inspection Hours
Coupling, main transmission drive shaft	369D/E/F/FF	369H5660	4300	
	500N	369H5660	3200	
Overrunning clutch assembly	369D/E/F/FF 500/600N	369F5450–501	On Cond.	100 (24)
Sprag assembly, overrunning clutch	369D/E/F/FF	369A5364 369D25351	(3)	300 (10)
	500N	369D25351	(3)	300 (10)
	369D/E/F/FF 500/600N	369F5456	(3)	300 (17)
Drive shaft, fan	500N	500N5200	2620	
	600N	500N5200	1200 (36)	
Drive shaft, tail rotor	369D/E	369D25518	13900	
	369F/FF	369DSK152–11 369D25518–503	13900 14610	
Coupling – tail rotor drive shaft (Bendix) (**NOTE**: Not certified on 369FF Model) (9)	369D/E/F	369A5501 369H92564 (7)	4980 4980	
Anti–Torque System				
Gearshaft assembly, tail rotor input	369D/E	369D25434	12000	
	369F/FF	369D25434	3365	
Gearshaft, tail rotor output pinion	369D/E/F/FF	369D25430	7290	
Blade assembly, tail rotor	369D/E	369D21613 369D21613–11 369D21613–31 369D21613–41 369D21613–51 369D21613–61 369D21613–71 369D21640–501 (38) 369D21640–503 (38) 369D21640–505 (38)	5200 5140 5140 5140 5140 5140 5140 400 5140 5140	
	369F/FF	369D21606 369D21642–501 (38) 369D21642–503 (38) 369D21642–505 (38)	5140 400 5140 5140	
Blade assembly, tail rotor (optional 4–blade)	369D/E	369D21615 369D21641–501 (38) 369D21641–503 (38) 369D21641–505 (38)	10000 400 10000 10000	
Hub, tail rotor	369D/E/F/FF	369A1725	3450	

Table 1. Airworthiness Limitations Schedule (Cont.)

Component (1)	Model	Part Number (2)	Finite Life Hours (1)	Mandatory Inspection Hours
Retention strap assembly, tail rotor	369D/E/F	369A1706	5100	
	369FF	369A1706–507	5100	
		369A1706–509	5100	
Blade assembly, NOTAR fan	500N	500N5310–15	7500	
		500N5310–19	7500	
	600N	500N5310–19	12500	
Hub, fan	500N	500N5352–7	7500	
		500N5352–9	7500	
	600N	500N5352–9	7500	
Shaft, NOTAR fan support	600N	500N5357–13	4000	
Pitch plate assembly	500/600N	500N5363–7	7500	
Tube assembly, fan pitch	500N	500N7113–3	600 (18)	
Rotating cone assembly	500N	500N3740–1	10000	
		500N3740–41	10000	
	600N	500N3740–61	10000	
Tailboom				
Bolts, tailboom attach	369D/E/F/FF	MS21250–06014	21950	
Tailboom assembly	369D/E	369D23500	10300	
	369F/FF	369D23500–507	10300	
	500N	500N3500–19	10000	100 (14)
		500N3500–29	10000	
		500N3500–501	10000	
		500N3600–501	2400 (19)	
	600N	600N3500–503	2500 (25)	
		600N3500–505	5900	
		600N3500–507	1000	
		600N3500–509	6000 (19)	
		600N3500–511	6000 (19)	
		600N3500–513	2500 (25)	
		600N3500–515	5900	
		600N3500–517	1000	
Empennage fittings	600N	500N3530–7/8	On Cond.	100 (26)
		500N3530–9/10	On Cond.	100 (26)
Vertical stabilizer assembly	369D/E	369D23600	12700	
	369F/FF	369D23600–505	3388	
Torque tube, horizontal stabilizer	500N	500N3950–5	5000	
	600N	500N3950–7	3000	
		600N3950	1000 (19)	

Table 1. Airworthiness Limitations Schedule (Cont.)

Component (1)	Model	Part Number (2)	Finite Life Hours (1)	Mandatory Inspection Hours
Horizontal stabilizer assembly	369D (12)	369D23601	7700	
	369E (12)	421–087–505	7700	
		421–087–905 (13)	7700	
	369F/FF (12)	421–087–503	7700	
		421–087–903	7700	
	600N	500N3910–25	10000 (19)	
		500N3910–27	10000 (19)	
Controls				
Longitudinal idler bellcrank assembly	369D	369A7301	6500	
		369A7301–501	6500	
	369E/F/FF	369A7301–501	6500	
	500N	369A7301–501	2870	
Idler assembly, longitudinal pitch mixer	369D/E/F/FF	369A7603	13600	
	500N	369A7603	6050	
Longitudinal control rod	500N	369A7011–13	7740	
		369A7011–15	7740	
Socket, cyclic stick	600N	369A7141	1000	8 (27)
Cyclic tube assembly	600N	369D27132–503	1200	8 (27)
Housing, collective stick	600N	369A7347	450	
Tube, collective pitch control	600N	369A7348	400	
Tube assembly, collective pitch (pilot)	600N	369H7354–3	600	
Socket, cyclic stick	600N	369A7802	1000	8 (27)
Tube, collective pitch (co–pilot)	600N	369A7809	1800	
Housing, collective stick	600N	369A7820	450	
Housing, collective stick	600N	369H7837	450	
Tube assembly, collective pitch (co–pilot)	600N	369H7838–3	1000	
Fuselage Sta. 75 controls support bracket	600N	369N2608–11	6000 (41)	
		600N2608–9	Unlimited	
Airframe				
Landing gear brace	600N	600N6010–17/19	5900 (28)	
Landing gear strut	600N	600N6022–7/8	696 (29)	
Landing gear foot	600N	600N6043–3	3900 (30)	
Floats				
Squib cartridge, used on Emergency float kit 369D292473–5, –6, –9, –10, –11, –12 **NOTE:** Life is based from original date of manufacture.	369D/E/F/FF 500N	12552–1 (Holex, Inc.)	5 years	
		281993 (Walter Kidde)	5 years	
		12754–1 (Holex, Inc.)	5 years	
		5003527 (Tavco)	5 years	

Table 1. Airworthiness Limitations Schedule (Cont.)

Component (1)	Model	Part Number (2)	Finite Life Hours (1)	Mandatory Inspection Hours
Stabilizer support, utility float	369D/E	369D292036 369DSK66	3190 3190	

NOTES:

(1) Life–limited components interchanged between models or configurations must be restricted to the lowest service life indicated for the models or configurations affected. Life–limited components removed at retirement are to be mutilated/destroyed or conspicuously marked to prevent inadvertent return to service. Parts are applicable only on models under which a service life is listed.
Life–limited components cannot be altered or permanently marked in any manner without compromising the part integrity. Part tagging or other record keeping system is required.
Related component records must be updated each time component is removed from service.

(2) Service life shown for the basic (no dash number) part numbers apply to all dash numbered versions unless otherwise indicated.

(3) With no cargo hook attached: – No retirement life assigned (Ref. Sec. 05–10–00, Component Overhaul or Recommended Replacement Schedule).
With cargo hook attached and no separate log: – 1800 hours.
With cargo hook attached and with separate log: – 1800 hours of external load operating time when logged separately.
(For 369D/E/F/FF helicopters with 369A5364 or 369D25351 sprag assembly, Refer to AD 90–19–02.)

(4) Inspect in accordance with Main Rotor Strap Pack Lamination Inspection at 100–hour intervals, or 25–hour intervals if 2 laminates (369D/E/F/FF – 500N) or 1 laminate (600N) have failed in any one leg or tongue area of any strap assembly. A single cracked laminate between the shoes at the outboard end of a strap pack is cause for rejection of the hub assembly
369D/E/F/FF – 500N: (Ref. Sec. 62–20–00, Main Rotor Strap Pack Lamination Inspection).
600N: (Ref. Sec. 62–20–60, Main Rotor Strap Pack Lamination Inspection).
(For 369D/E/F/FF helicopters, refer to AD 89–02–01.)

(5) The 369D21100–513, –515, 516, 517 and –523 main rotor blades are not interchangeable with any earlier configuration blades (Basic, –505 or –509); however, the –505 and –509 blades are interchangeable and the –513 and –515 blades are interchangeable. The –505 and –509 configuration blades may be modified to the –513M configuration, which is fully compatible with the –513 blade. (For information concerning modification, contact MDHI Customer Service Department.)

(6) For the 369D/E helicopters, the 369D21120–501, –503 main rotor blade has all the same inspections and interchangeability as the 369D21100–517 main rotor blade.
For the 369F/FF – 500N helicopters, the 369D21121–501, –503 main rotor blade has all the same inspections and interchangeability as the 369D21102–517 main rotor blade.
For the 600N helicopters, the 369D21121–501, –503 main rotor blade has all the same inspections and interchangeability as the 369D21102–523 main rotor blade.

(7) Used with 369H90123 Rotor Brake Kit.

(8) Inspect main rotor drive shaft every 300 hours (Ref. Sec. 63–10–00, Main Rotor Drive Shaft Inspection (300 Hour)) (Reference AD 81–26–01).

(9) Failsafe device, P/N 369D25530 bolt and 369D25531 socket, must be used at both ends of tail rotor driveshaft in accordance with Tail Rotor Drive Shaft Installation with Bendix Couplings (Reference AD 86–20–07).

(10) For helicopters equipped with a cargo hook, inspect overrunning clutch sprag assembly P/N 369D25351, clutch inner race P/N 369A5353 and outer race 369A5352 every 300 hours (Ref. C.O.M., Sec. 63–10–10, Overrunning Clutch Sprag Inspection (300 Hour)). To establish time in service, either clutch total time with hook attached or a separate and permanent log of external load operating time per CFR 91.417, may be used.
(For 369D/E/F/FF helicopters with 369A5364 or 369D25351 sprag assembly, Refer to AD 90–19–02.)

(11) Inspect main rotor blade root fittings and main rotor lead–lag link assemblies every 25 hours in accordance with Main Rotor Blade Upper and Lower Root Fitting Attach Lug and Lead–Lag Link Attach Lug Inspection (25 Hour) and every 100 hours in accordance with Main Rotor Blade Upper and Lower Root, Fitting Attach Lug and Lead–Lag Link Attach Lug Inspection (100 Hour) (Ref. Sec. 62–10–00) (Reference AD 95–03–13).

(12) Tip plates, tip weights (where applicable) and attaching hardware have no retirement life and may be reused on replacement horizontal stabilizers.

(13) 421–087–903 and –905 require addition of tip plates, tip weights and attaching hardware before installation.

(14) Inspect the three upper slot bridges for cracks (Ref. Sec. 05–20–00).

(15) Inspect main rotor drive shaft every 300 hours (Ref. Sec. 63–10–00, Main Rotor Drive Shaft Inspection (300 Hour)).

(16) Inspect for deterioration every 600 hours up to a total time of 4200 hours and every 300 hours thereafter until deterioration is sufficient to retire assembly
369D/E/FF – 500N: (Ref. Sec. 62–20–00, Main Rotor Damper and Attachments Inspection)
600N: (Ref. Sec. 62–20–60, Main Rotor Damper and Attachments Inspection).

(17) For helicopters equipped with a cargo hook, inspect overrunning clutch sprag assembly P/N 369F5456, clutch inner race P/N 369F5455 and outer race 369F5453 every 300 hours. To establish time in service, either clutch total time with hook attached or a separate and permanent log of external load operating time may be used.

(18) 500N7113–11 tube assembly, fan pitch is an On–Condition part and replaces the 500N7113–3 tube assembly.

(19) Interim hours: life extension testing in progress.

(20) Inspect upper and lower blade root fittings every 100 hours in accordance with Main Rotor Blade Upper and Lower Root, Fitting Attach Lug and Lead–Lag Link Attach Lug Inspection (100 Hour) (Ref. Sec. 62–10–00)
(For 369D/E/F/FF – 500N helicopters, Reference AD 96–10–09).

(21) Main rotor blades, P/N 369D21102–517 with S/N 1976 thru 2100, 2106 thru 2115 are not to be installed on 600N helicopter (Reference Service Bulletin SB600N–007R2) (Reference AD 98–15–26).

(22) Inspect main rotor blades with 600 or more hours of operation every 25 hours of helicopter operation with a 10X magnifying glass for cracking of the lower surface of the blade emanating from the root fitting and doubler at the inboard end of the blade and to detect debonding between the blade root end fitting and doubler if missing or cracked adhesive or paint is observed. (Reference Service Bulletins SB369D–195R3, SB369E–088R3, SB369F–075R3, SB500N–015R3) (Reference AD 98–15–26).

(23) Perform Main Rotor Blade Upper and Lower Root, Fitting Attach Lug and Lead–Lag Link Attach Lug Inspection (25 Hour) up to a total time of 500 hours and every 15 hours thereafter and every 100 hours in accordance with Main Rotor Blade Upper and Lower Root Fitting, Attach Lug and Lead–Lag Link Attach Lug Inspection (100 Hour) (Ref. Sec. 62–10–00) until retirement of 369H1203–BSC and –21 Lead–Lag Link Assembly. (Reference AD 95–03–13).

(24) Inspect clutch retainer and bearing carrier for evidence of spinning and/or wear (Ref. Sec. 05–20–20).

(25) The 600N3500–503 tailboom may be reworked to a 600N3500–505 tailboom, and the 600N3500–513 tailboom may be reworked to a 600N3500–515 tailboom by modifying the attachment fittings to all–steel fittings.

(26) (Ref. Sec. 05–20–00) Using a flashlight and 10X magnifying glass, inspect horizontal stabilizer mounting brackets for cracks (pay particular attention to the forward inboard legs) (Ref. Tailboom Inspection).

(27) Sockets must be inspected for cracks every eight hours after the initial 100 hour inspection.

(28) Log all landings: Brace life is limited to 35400 logged landings or 5900 hours flight time if landing are not logged (assumed six landings per one hour of flight time).

(29) Log all landings: Strut life is limited to 4170 logged landings or 696 hours flight time if landing are not logged (assumed six landings per one hour of flight time).

(30) Log all landings: Foot life is limited to 23780 logged landings or 3900 hours flight time if landing are not logged (assumed six landings per one hour of flight time).

(31) The following main rotor blades have a finite life of 2,500 hours or 15,000 torque events*, whichever occurs first;
P/N 369D21100–517 with S/N H664, H665, H667, H669, H671, H672, H674, H676, H679, H680, H683 thru H724, H726 thru H999 and J000 thru J039, J041 thru J055 and
P/N 369D21102–517 with S/N 1976 thru 2100, 2106 thru 2115.
* TORQUE EVENT (TE) – A TE is recorded for every transition from forward flight to a hover (Reference Service Bulletins SB369D–195R3, SB369E–088R3, SB369F–075R3, SB500N–015R3).

(32) RIN = (200 x Hrs.) + (52 x TE).

(33) RIN = (160 x Hrs.) + (24 x TE).

(34) RIN = (153 x Hrs.) + (3 x TE).

(35) RIN = (50 x Hrs.) + (3 x TE).

(36) RIN = (768 x Hrs.) + (11 x TE).

(37) After accumulation of 750 flight hours and 13,720 TE, perform Main Rotor Blade Torque Event Inspection (Ref. Sec. 62–10–00) every 35 flight hours or 200 TE's (whichever occurs first).

(38) The 369D21640–501, –503, –505 tail rotor blades are two–way interchangeable with the 369D21613 tail rotor blades in sets of two only.
The 369D21641–501, –503, –505 tail rotor blades are two–way interchangeable with the 369D21615 tail rotor blades in sets of two only (installed on the same inboard or outboard hub).
The 369D21642–501, –503, –505 tail rotor blades are two–way interchangeable with the 369D21606 tail rotor blades in sets of two only.

(39) The 369H1203–BSC, –11, –21, –31, –51 and –61 lead lag link assemblies can only be installed using the 369H1235–BSC bearing.

(40) The 369H1203–53 lead lag link assembly can only be installed using the 369H1235–1 bearing.

(41) The 369N2608–11 Control Support Bracket must be removed from 600N helicopters equipped with YSAS (Ref. SB600N–040).

CONTINUED AIRWORTHINESS

SPECIAL INSPECTIONS

1. Special Inspection Hourly and Calendar

This table is a schedule of time-phase inspections that are contingent upon elapsed flight time or calendar time. These inspections require a Log Book entry. Adherence to Maintenance Manual information is required, and the manual should be consulted when using this checklist.

NOTE:

- The Chap/Sect column of the following table is for reference unless a specific inspection requirement is called out. If there is only two numbers in the column, it refers to the Chapter. If there is three numbers, it refers to the Section the inspection is found.
- Refer to applicable Rolls-Royce engine inspection check list for required engine maintenance.

Table 1. Special Inspections Hourly

Model	What to Inspect	Chap/Sect
AFTER INSTALLATION OF NEW 369F5100 MAIN ROTOR TRANSMISSION		
ALL	Perform transmission run–in (Ref. Main Transmission Run–In Procedure)	63–20–25
2 – 10 HOURS AFTER INSTALLATION OF TAIL ROTOR TRANSMISSION		
369D/E/FF	Using drag torque previously recorded, apply a torque load of **95 ±3 inch–pounds (10.73 ±0.34 Nm) plus the noted drag torque** (noted for each individual nut) to each mounting nut of the transmission (Ref. Tail Rotor Transmission Installation).	63–25–10
EVERY 15 HOURS		
369D/E/FF	Effectivity: 369H1203–BSC or 369H1203–21 lead–lag link assemblies with at least 500 hours, perform Main Rotor Blade Upper and Lower Root Fitting Attach Lug and Lead–Lag Link Attach Lug Inspection (25 Hour) and every 100 hours in accordance with Main Rotor Blade Upper and Lower Root Fitting Attach Lug and Lead–Lag Link Attach Lug Inspection (100 Hour) until retirement of 369H1203–BSC or–21 Lead–Lag Link Assembly. (Reference AD 95–03–13).	62–10–00
25 HOURS AFTER REPLACING TAIL ROTOR DRIVE FORK HINGE BOLT		
369D/E/FF	Check rotational torque of bolt by applying **125 inch–pounds (14.12 Nm)** with torque wrench. If 125 inch–pounds (14.12 Nm) torque does not rotate bolt, preload is correct (Ref. COM, Hub and Fork Assembly).	64–20–10 64–20–20
25 HOURS AFTER INSTALLATION OF OIL COOLER BLOWER		
ALL	With two pounds of force applied, check belt tension for 0.17 to 0.20 inch (4.32 – 5.08 mm) deflection. Check pulley (Ref. Cooling Blower Belt Tension Check and Adjustment). Check oil cooler blower driven pulley retaining nut for minimum torque of **160 inch–pounds (18.08 Nm)**. If loss of torque is noted, remove pulley nut and inspect pulley shaft and splines for condition. Reinstall nut and torque to **160 – 190 inch–pounds (18.08 – 21.47 Nm) plus drag torque**.	63
EVERY 25 HOURS WITH 2 FAILED LAMINATES IN MAIN ROTOR STRAP ASSEMBLY		
369D/F/FF 500N	Inspect in accordance with Main Rotor Strap Pack Lamination Inspection at 25–hour intervals if 2 laminates have failed in any one leg or tongue area of any strap assembly. A single cracked laminate between the shoes at the outboard end of a strap pack is cause for rejection of the hub assembly (Ref. Main Rotor Strap Pack Lamination Inspection).	62–20–00

Table 1. Special Inspections Hourly (Cont.)

Model	What to Inspect	Chap/Sect
EVERY 25 HOURS WITH 1 FAILED LAMINATES IN MAIN ROTOR STRAP ASSEMBLY		
600N	Inspect in accordance with Main Rotor Strap Pack Lamination Inspection at 25–hour intervals if 1 laminate has failed in any one leg or tongue area of any strap assembly. A single cracked laminate between the shoes at the outboard end of a strap pack is cause for rejection of the hub assembly (Ref. Main Rotor Strap Pack Lamination Inspection).	62–20–60
EVERY 25 HOURS		
NOTE: This inspection does not apply to 369D21100–516, –517, –523 and 369D21102–503, –517, –523 main rotor blades or the 369H1203–51 and –61 lead–lag links.		
369D/E/FF	Visually inspect exposed portion of all installed main rotor blade upper and lower root fitting attach lugs and main rotor hub lead–lag link attach lugs for broken or cracked lugs, corrosion or other damage to the lug areas (Ref. Main Rotor Blade Upper and Lower Root Fitting Attach Lug and Lead–Lag Link Attach Lug Inspection (25–Hour)).	62–10–00
600N	(Effectivity: RN003–RN077, Ref. SB600N–039), Perform Tailboom Attach Fitting Inspection (Ref. EAD 2001–24–51).	53–30–30
EVERY 50 HOURS		
369D/E/FF 500N	Effectivity: On models equipped with Rotorcraft Litter Kit: visually inspect litter doors for condition and security of quick–release fasteners. Rubber gasket between window glass and door for proper sealing.	CSP–026
EVERY 50 HOURS IF CRACKS ARE FOUND IN FAN LINER		
NOTE: If cracks protrude into Felt Metal Seal, replace seal.		
500/600N	Inspect fan liner to ensure cracks do not protrude into Felt Metal Seal (Ref. Anti–Torque Fan Liner (Felt Metal Seal) Inspection).	64–25–30
EVERY 100 HOURS		
ALL	If installed, floats and associated components for condition and security.	32
ALL	Effectivity: With 369F5450–501 overrunning clutch installed, remove clutch assembly and inspect clutch retainer, bearing carrier and housing at pin and shoulder for evidence of spinning and/or wear. If spinning and/or wear is observed, replace clutch assembly.	63
EVERY 300 HOURS OR ONE YEAR (Whichever occurs first)		
ALL	Effectivity: For 369D25100 main transmission serviced with MIL–L–23699 oil, drain main transmission oil system; Flush with sufficient new oil to remove sludge accumulation. Replace filter and refill with new oil.	12
500/600N	Effectivity: Forward and center cable couplings; Using a bright light and 10X magnifying glass, inspect inner coupling male and female connectors for corrosion pitting or cracks; none allowed.	67–20–30
EVERY 300 HOURS OR TWO YEARS (Whichever occurs first)		
600N	Main rotor upper thrust bearing assembly must be relubricated every 2 years or 300 hours, whichever occurs first (Ref. Main Rotor Hub Upper Bearing Grease Repack, Inspection and Replacement).	62–20–60

Table 1. Special Inspections Hourly (Cont.)

Model	What to Inspect	Chap/Sect
EVERY 300 HOURS		
ALL	Effectivity: 369D21400–503 (369D/E/FF – 500/600N) or M50452 (369D/E/FF – 500N) lead–lag dampers with at least 4200 hours, inspect for deterioration until deterioration is sufficient to retire assembly (Ref. Main Rotor Damper and Attachments Inspection and Main Rotor Damper Weight Loading and Extension Check).	62–20–00 62–20–60
NOTE: The following inspection does not apply to 369D25100–505 and –507 transmissions.		
369D/E/FF	Visually inspect upper surface of main transmission output shaft assembly (ring gear carrier) for bulging or raised surfaces. Using 10X magnifying glass, inspect upper surface of shaft for cracks. (Ref. COM, Output Drive Shaft Visual Inspection)	63–20–00
369D/E 500/600N	Replace anti–ice/airframe fuel filter element (if installed) (Ref. Anti–Ice Fuel Filter Replacement).	28–25–00
ALL	Mist eliminator and access door for proper installation (attaching hardware for security).	71
ALL	Hoist installation (if installed) for condition and security.	25
EVERY 600 HOURS OR ONE YEAR (Whichever occurs first)		
ALL	Effectivity: 369D25100 main transmission serviced with Mobil SHC 626 oil and 369F5100 main transmission, drain main transmission oil system; Flush with sufficient new oil to remove sludge accumulation. Replace filter and refill with new oil.	12
369D/E/FF 500N	Effectivity: 369F5510 Main Rotor Drive Shaft, perform 369F5510 Main Rotor Drive Shaft Inspection (Ref. 600N5510 and 369F5510 Main Rotor Drive Shaft Inspection).	63–10–00
600N	Effectivity: 600N5510 Main Rotor Drive Shaft, perform 600N5510 Main Rotor Drive Shaft Inspection (Ref. 600N5510 and 369F5510 Main Rotor Drive Shaft Inspection).	63–10–00
EVERY 600 HOURS		
ALL	Cyclic control system for excessive slack or free play. Cyclic control stick, at grip, for play in excess of 3/8 inch (9.53 mm) (Ref. Main Rotor Flight Control System 600–Hour Inspection).	67–10–00
ALL	Effectivity: 369D21400–503 (369D/E/FF – 500/600N) or M50452 (369D/E/FF – 500N) lead–lag dampers with less than 4200 hours, inspect for deterioration until deterioration is sufficient to retire assembly (Ref. Main Rotor Damper and Attachments Inspection and Main Rotor Damper Weight Loading and Extension Check).	62–20–00 62–20–60
500/600N	Using a dial indicator, measure the rotation of the fan pitch control clevis mounted on the fan pitch control tube. If clevis rotation is more than 0.025 in. (0.635 mm), inspect splines on fan pitch control tube (Ref. Fan Pitch Control Tube Inspection) and splines in tube support (Ref. Tube Support Inspection).	63–25–30 67–20–30
EVERY 1200 HOURS		
ALL	Test battery over temperature sensor unit for proper operation and accuracy (Ref. Battery Temperature Sensing Equipment Operational Check).	96–05–00
500/600N	Perform visual inspection, using a 10x magnifying glass, on horizontal stabilizer mounting brackets (pay particular attention to the forward inboard legs).	53
500N	Regrease YSAS actuator (Ref. YSAS Actuator Regrease Procedure).	67–20–30
EVERY 1200 HOURS OR 2 YEARS (WHICHEVER OCCURS FIRST)		
500/600N	Clean, inspect and relubricate (repack) fan support and pitch plate bearings (Ref. Anti–Torque Fan Bearing Regreasing).	64–25–30

Table 1. Special Inspections Hourly (Cont.)

Model	What to Inspect	Chap/Sect
500/600N	Perform Anti–Torque Fan Inspection.	64–25–30
500/600N	Check pitch bearing retainer for cracks or damage.	64
EVERY 2700 HOURS OR 2 YEARS (WHICHEVER OCCURS FIRST)		
600N	Main rotor lower thrust bearing assembly must be relubricated every 2 years or 2700 hours, whichever occurs first.	62–20–60
600N	Clean, inspect and relubricate (repack) main rotor swashplate bearings.	62–30–60
EVERY 2770 HOURS OR 2 YEARS (WHICHEVER OCCURS FIRST)		
369D/E/FF 500N	Clean, inspect and relubricate (repack) main rotor swashplate bearings and main rotor hub tapered bearings (Ref. Main Rotor Hub Tapered Bearing Replacement).	62–20–00
369D/E/FF	Clean, inspect and relubricate (repack) tail rotor swashplate bearings (Ref. Tail Rotor Swashplate Bearing Regreasing).	64–30–00
EVERY 3,000 HOURS		
600N	Replace tailboom attach bolts with new bolts, scrap removed bolts (Ref. Tailboom Installation). Inspect radius blocks and tailboom attach points for corrosion and cracks (Ref Tailboom Inspection).	53–40–30
EVERY 6,000 HOURS		
369D	Replace the 369H6414 Edgelighted Panel (Ref. Instrument Panel Lights Description and Replacement).	96–40–00
AT 6000 HOURS AND EVERY 100 HOURS THEREAFTER		
600N	Remove tunnel control boot. Inspect interface between 369H2564 tunnel beams and 369D22508–7 web for cracks (Ref. Control Tunnel (FS 78.50) Beam Inspection).	53–30–30
600N	Perform Forward Upper Longeron Inspection (L137, R137).	53–30–30
AT 15,000 HOURS AND EVERY 1500 HOURS THEREAFTER		
600N	Perform Lower Longeron Inspection (L158, R158).	53–30–30

Table 2. Special Inspections Calendar

Model	What to Inspect	Section
(DAILY) BEFORE FINAL SHUTDOWN IN CORROSIVE ENVIRONMENT		
ALL	It is recommended that before shutdown from the last flight of the day, for helicopters operating in a corrosive environment, a Tri–Flow wash be preformed on the main rotor hub and strap pack assembly (Ref. Main Rotor Hub Corrosion Prevention (Tri–Flow Wash Procedure)).	20–40–00
(DAILY) AFTER FINAL SHUTDOWN IN CORROSIVE ENVIRONMENT		
500N	It is recommended that after shutdown from the last flight of the day, for helicopters operating in a corrosive environment, the splitter bungee spring be sprayed with Tri–Flow.	20
EVERY 6 MONTHS OR 5 INFLATIONS		
ALL	Inflate emergency floats to 4.5 psi (0.3164 kg/cm^2) for one hour. Check for leaks and condition. Continue inflation to 5.5 psi (0.3867 kg/cm^2) and check that chamber pressure relief valves operate. Pressure–test float compartments (Ref. Float Compartments Pressure Test).	32–82–00
AFTER COMPRESSOR WATER WASH/RINSE WITH PARTICLE SEPARATOR INSTALLED		
ALL	During engine run after compressor water wash with particle separator installed, it is recommended that scavenge air switch be switched on to remove any moisture that has accumulated in the solenoid air valve.	RFM
BEFORE OPERATION OF BREEZE HOIST SYSTEM		
ALL	Prior to daily hoisting operations: unreel and inspect entire length of hoist cable for broken strands (cluster of 7 wires), excessive broken wires, corrosion, and security of attachment to cable drums and swivel hook. Replace cable if broken strand or excessive broken wires are noted. (Refer to hoist manufacturer's handbook, Table 201.)	01

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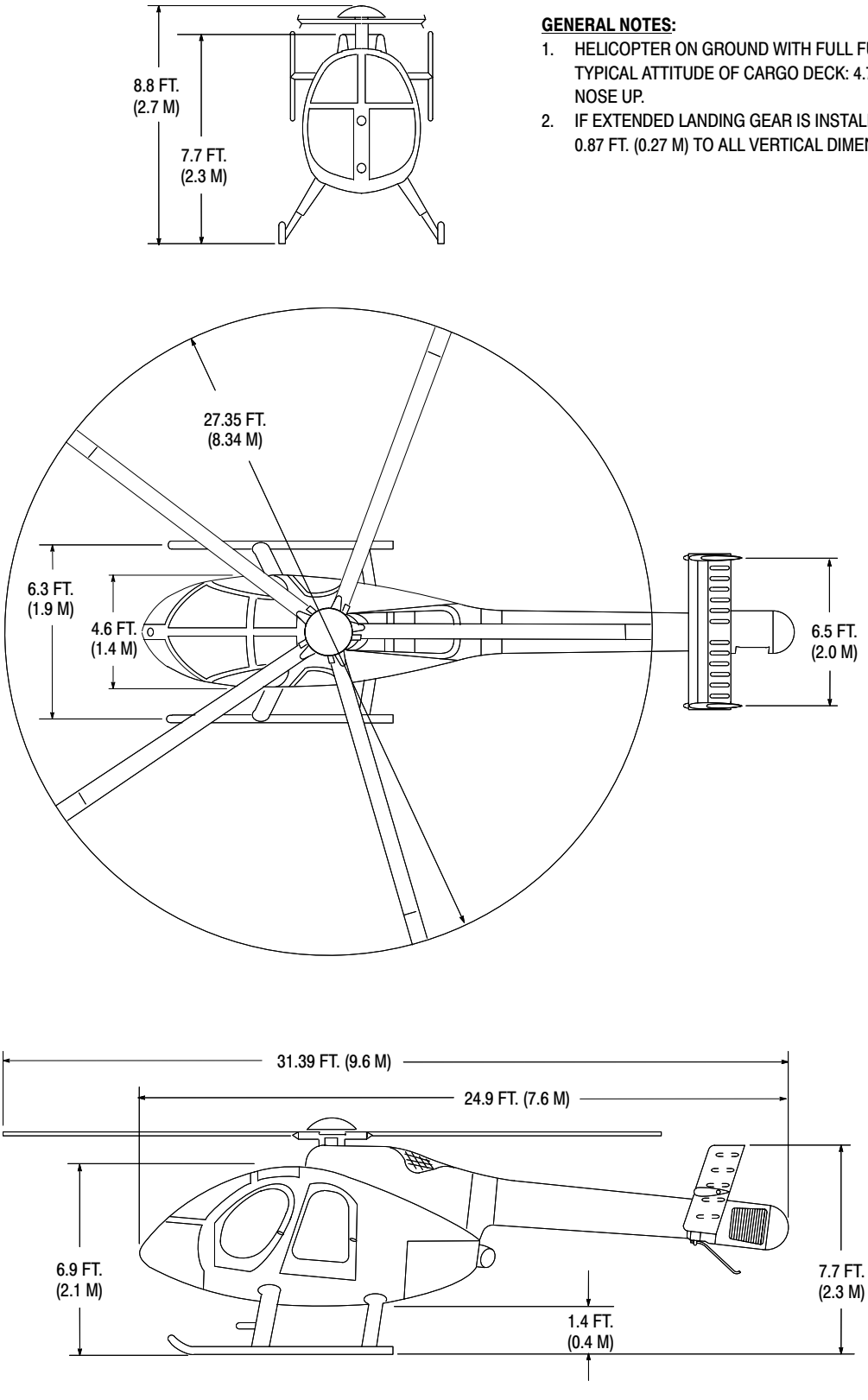
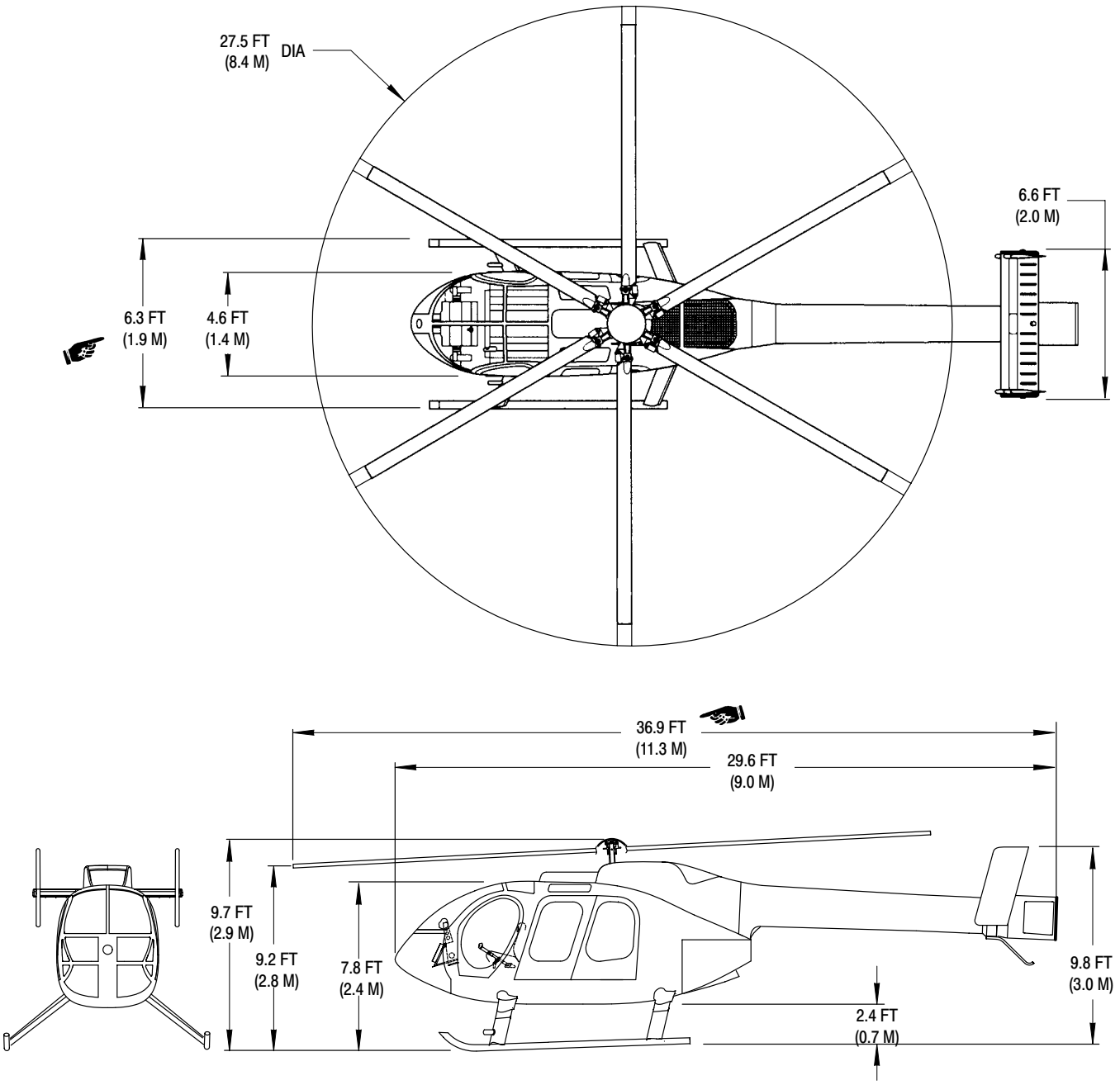


Figure 204. Principal Dimensions – Model 500N

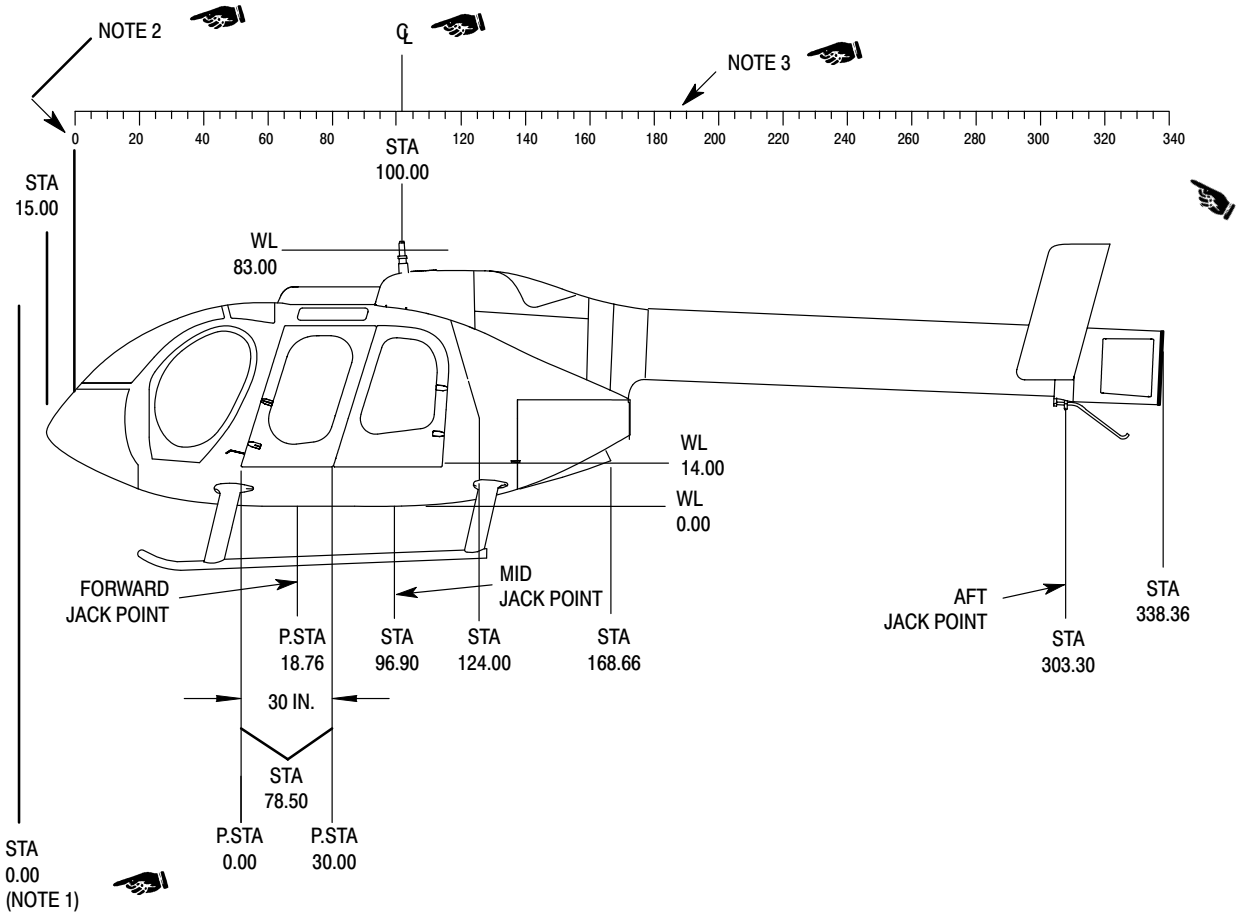


GENERAL NOTES:

1. HELICOPTER ON GROUND WITH FULL FUEL.
   TYPICAL ATTITUDE OF CARGO DECK 5.3 DEGREES NOSE UP.
2. HEIGHT ABOVE GROUND DIMENSIONS VARY WITH INSTALLED EQUIPMENT, CENTER OF GRAVITY AND TERRAIN FEATURES.
3. ALL DIMENSIONS SHOWN DEPICT EXTENDED LANDING GEAR.

6G06-043C

Figure 205. Principal Dimensions – Model 600N (Sheet 1 of 2)

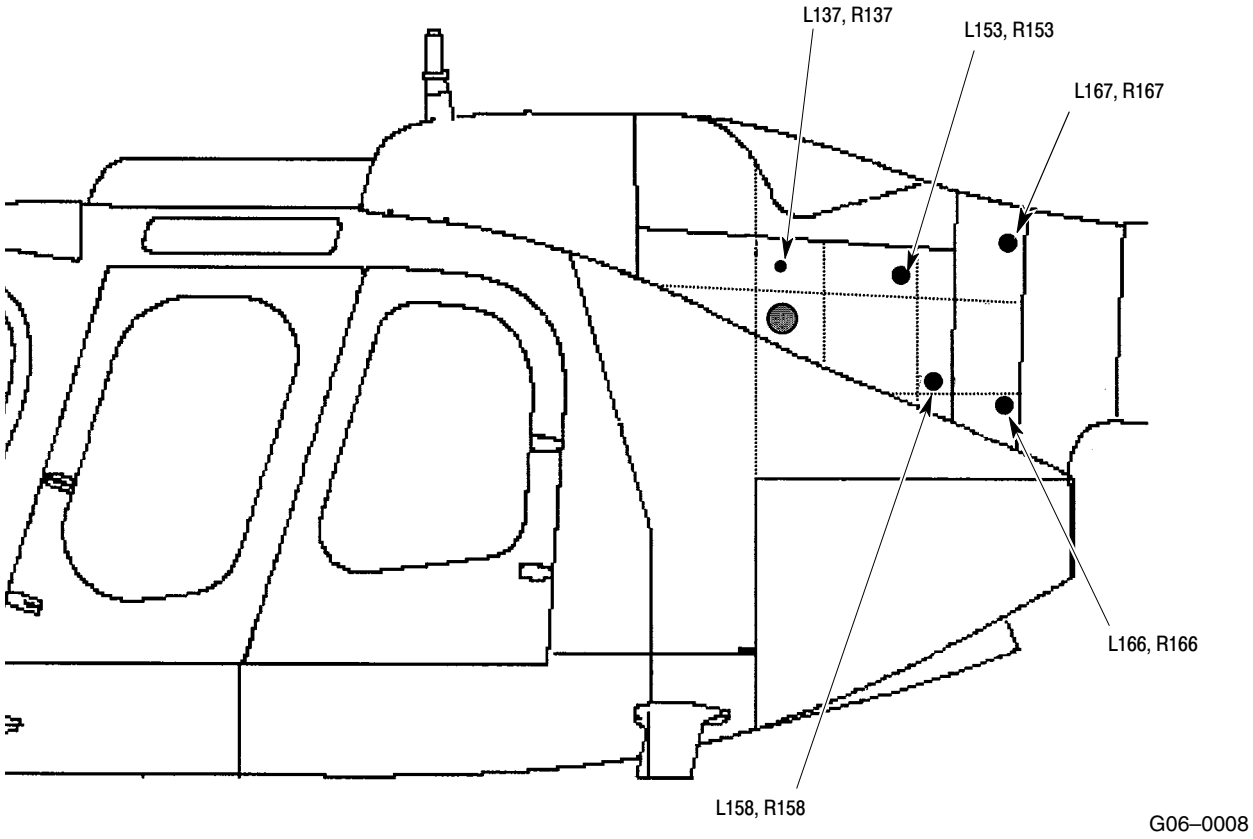


NOTES:

1. STA. 0.00, 15 INCHES (381 MM) FORWARD OF NOSE OF AIRCRAFT.
2. THIS DIMENSION 15 INCHES (381 MM) AFT OF NOSE OF AIRCRAFT.
3. THESE DIMENSIONS IN INCHES.

6G06-004BA

Figure 209. Fuselage Station Diagram – Model 600N



Item No.	Name	Permits Access To	Qty.	Type
L137	Plug	Left forward upper longeron	1	Plug Button
R137	Plug	Right forward upper longeron	1	Plug Button
L153	Plug	Left upper longeron	1	Plug Button
R153	Plug	Right upper longeron	1	Plug Button
L158	Plug	Left lower longeron	1	Plug Button
R158	Plug	Right lower longeron	1	Plug Button
L166	Plug	Left lower attach fitting	1	Plug Button
R166	Plug	Right lower attach fitting	1	Plug Button
L167	Plug	Left upper attach fitting	1	Plug Button
R167	Plug	Right upper attach fitting	1	Plug Button

Figure 210. Aft Empenage Access Plugs – Model 600N

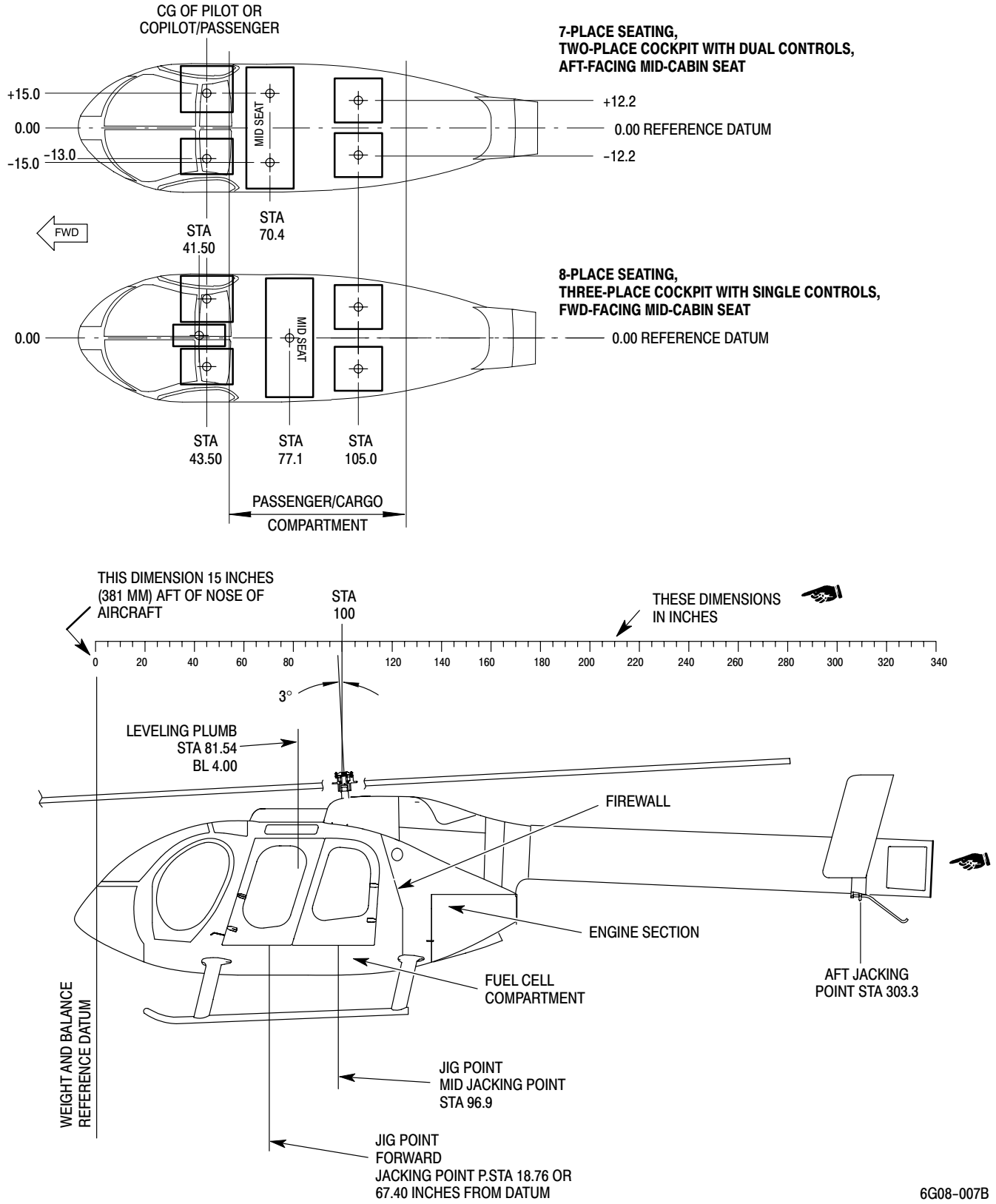


Figure 205. Balance Diagram – Model 600N

WEIGHT AND BALANCE REPORT

MODEL _____

WEIGHED BY _____ CONFIGURATION _____

MODEL _____ SERIAL NO. _____ REGISTRATION NO. _____ DATE _____

WEIGHING POINTS	SCALE READING (LBS)	TARE OR CALIBRATION CORRECTION (LBS)	NET WEIGHT (LBS)	LONGITU-DINAL ARM (INCHES)	LATERAL ARM (INCHES)	LONGITU-DINAL MOMENT (INCH–LBS)	LATERAL MOMENT (INCH–LBS)
LEFT MAIN				96.9	–26.0		
RIGHT MAIN				96.9	+26.0		
TAIL				303.3	0.0		
TOTAL UNADJUSTED NET WEIGHT							
TOTAL WEIGHT OF SURPLUS EQUIPMENT (SEE TABLE 1)			–				
TOTAL WEIGHT OF MISSING EQUIPMENT (SEE TABLE 1)			+				
TOTAL BASIC WEIGHT							

FUEL/OIL ABOARD AT TIME OF WEIGHING:

	EMPTY	FULL
FUEL		
ENGINE OIL		
MAIN GEAR BOX		
TAIL GEAR BOX		

FORM 765B (REV 4–83) Page 1 of _____

McDonnell Douglas Helicopter Company

Figure 206. Weight and Balance Report Form (Sheet 1 of 2)

6. Fuel Quantity Transmitter Replacement

A. Fuel Quantity Transmitter Removal

(Ref. Figure 404)

WARNING **Avoid fuel vapor ignition and fire. Use only nonsparking tools and explosion proof work lights. Attach helicopter to an approved electrical ground. Switch OFF all electrical power. Disconnect external power and battery before opening fuel system. Ensure work area is adequately ventilated.**

(1). Defuel helicopter. Drain remaining fuel from tank sump drain valve into a suitable container.

WARNING **Prevent spontaneous combustion or explosion. Never use oxygen to purge or ventilate fuel tank or fuel system components. Fuel, either vapor or liquid, will violently react with an oxygen rich atmosphere.**

(2). Ventilate fuel tank with an inert gas such as nitrogen or low pressure compressed air applied through filler neck.

(3). Remove left fuel tank access panel from passenger/cargo compartment floor.

(4). Unplug fuel quantity transmitter connector from cell cover receptacle. Unclamp wire harness.

CAUTION

- Do not strain or bend fuel quantity transmitter float arm.
- Prevent fuel system contamination. Install a cover over quantity transmitter cell opening. Bag small parts to prevent loss or damage.

(5). Remove fuel quantity transmitter flange screws. Lift transmitter assembly out of cover opening. Discard gasket.

(6). Inspect fuel quantity transmitter as required (Ref. Fuel Quantity Transmitter Inspection).

(7). Calibrate quantity transmitter as required (Ref. Fuel Quantity Transmitter Calibration and Adjustment).

B. Fuel Quantity Transmitter Installation

(Ref. Figure 404)

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM124	Kerosene

(1). Wipe fuel quantity transmitter flange and cell fitting clean with kerosene (CM124) on a clean lint free cloth. Wipe parts dry.

(2). Position fuel quantity transmitter and flange gasket on cell with float inboard and clear of obstructions.

(3). Install screws and washers. Progressively torque screws to **20 - 25 inch-pounds (2.26 - 2.82 Nm)**. Lockwire screws.

(4). Attach fuel quantity electrical connector to receptacle. Lockwire connector.

(5). Perform a Fuel Quantity Transmitter Functional Check.

(6). Install left fuel tank floor access panel (Ref. Fuel Cell Cover Installation).

7. Fuel System Drain Valve Replacement

A. Fuel System Drain Valve Removal

WARNING **Avoid fuel vapor ignition and fire. Use only nonsparking tools and explosion proof work lights. Attach helicopter to an approved electrical ground. Switch OFF all electrical power. Disconnect external power and battery before opening fuel system. Ensure work area is adequately ventilated.**

CAUTION Helicopter must be defueled and drained prior to removing tank sump drain valve.

(1). Defuel helicopter, as required. Drain remaining fuel from tank sump drain valve into a suitable container.

(2). Remove lockwire from tank sump drain valve.

(3). Using appropriate socket or wrench, remove drain valve.

B. Fuel System Drain Valve Installation

Consumable Materials (Ref. Section 91–00–00)	
Item	Nomenclature
CM114	Petrolatum
CM124	Kerosene
CM702	Lockwire CRES

(1). Replace drain valve O-ring packings. Lubricate packings with kerosene (CM124), petrolatum (CM114) or jet fuel.

(2). Install and torque sump drain valve to **95 - 105 inch-pounds (10.73 - 11.86 Nm)**. Lockwire valve.

(3). Apply a torque alignment stripe to fuel line tube, hose and fitting fasteners.

(4). Refuel helicopter.

(5). Check drain valve for leakage.

(6). Apply external power.

(7). In crew compartment; set battery switch to **EXT PWR** position.

(8). Push fuel shutoff valve control knob in to open valve.

(9). With 250-C20B/R2 Engine: Set **START PUMP** switch **ON** to pressurize fuel system.

8. Fuel Cell Replacement

CAUTION

- Do not work on Uniroyal fuel cell in ambient temperatures below 50°F (10°C).
- Do not work on Engineering Fabric Corp. fuel cell in ambient temperatures below 70°F (21°C).

A. Fuel Cell Removal

WARNING **Avoid fuel vapor ignition and fire. Use only nonsparking tools and explosion proof work lights. Attach helicopter to an approved electrical ground. Switch OFF all electrical power. Disconnect external power and battery before opening fuel system. Ensure work area is adequately ventilated.**

CAUTION Prevent fuel system contamination. Install caps on the ends of hoses, tubes and fittings as parts are removed. Bag and identify small parts to prevent loss or damage.

(1). Defuel helicopter. Drain remaining fuel from tank sump drain valve into a suitable container.

WARNING **Prevent spontaneous combustion or explosion. Never use oxygen to purge or ventilate fuel tank or fuel system components. Fuel, either vapor or liquid, will violently react with an oxygen rich atmosphere.**

(2). Ventilate fuel tank with low pressure forced air or an inert gas such as nitrogen through filler neck.

(3). Remove right and left fuel tank access panels from passenger/cargo compartment floor.

NOTE: The following procedures are required to access and separate the fuel cell interconnect fitting and vent system aft crossover before either cell can be removed from its bay.

(4). Unclamp fuel supply tube between fuel shutoff valve and firewall Sta. 124.00 bulkhead elbow. Using a backup wrench on bulkhead elbow so it will not rotate, disconnect and remove tube.

(5). With 250-C20B/R2 Engine: Unclamp start pump wire harness and disconnect plug from cell cover receptacle.

(6). Unplug fuel quantity transmitter connector from cell cover receptacle.

(7). Unclamp and disconnect control cable from fuel shutoff valve.

WARNING **Avoid fuel vapor accumulation, ignition and fire. Use only non-sparking tools and explosion proof work lights. Attach helicopter to an approved electrical ground. Switch OFF all electrical power. Disconnect external power and battery before opening fuel system. Ensure work area is adequately ventilated.**

(1). Attach helicopter to an approved electrical ground.

(2). Defuel and drain fuel tank.

(3). Locate inclinometer on rear deck between Sta. 100 and 104.

(4). Jack and level helicopter or spot helicopter on level ground.

(5). Jack helicopter to get a 2° nose down attitude on the inclinometer. Stabilize helicopter with blocks as required.

(6). Reset **INST** and **PNL LT** circuit breakers.

(7). Apply external power. Set battery switch to **EXT PWR**.

NOTE: All gauge readings are taken from the centerline of the fuel quantity indicator pointer.

(8). Check that fuel quantity gauge needle points to empty, **E** with the pointer centerline between the outer and inner edge of the **E** graduation mark. Check that **FUEL LEVEL LOW** warning light is on.

NOTE: Do not bend float arm for adjustment of fuel quantity indicating system.

(9). If adjustments are required; shut down external electrical power, and remove transmitter, bend float stops as required and re-install transmitter.

(10). Pump seven gallons of fuel into tank.

(11). Apply external power. Set battery switch to **EXT PWR**.

FUEL LEVEL LOW warning light should be out, and gauge should indicate approximately 45 pounds.

(12). Disconnect fuel supply hose from engine.

(13). Have an assistant direct fuel hose into a suitable 10 gallon (37.85 L) container. Push fuel control valve knob in to open fuel shutoff valve.

(14). (C20 Series Engines) Set fuel start pump switch to **START PUMP**.

(15). (C30 Engine) Attach a siphon pump to fuel supply hose to suck fuel out of tank.

(16). Pump 0.5 – 1.5 gallons (1.89 – 5.68 L), 3.0 – 10.0 pounds (1.36 – 4.54 kg) out of the fuel tank while observing fuel gauge for erratic or hung movement. Fuel quantity gauge needle shall range between 34 – 42 pounds.

NOTE:

- **(C20 Series Engines)** A stuck needle on a new, calibrated and tested gauge may be due to transmitter float contact with the start pump wire, pump or supply hose.
- **(C30 Engine)** Transmitter float interference may be caused by the supply hose or sump pickup fitting.

(17). Loosen fuel quantity transmitter mounting flange screws. Rotate transmitter clockwise as far as it will move and tighten screws. Check gauge needle position.

(18). If float interference problem persists, remove quantity transmitter and determine action required to eliminate problem; i.e. reposition transmitter float arm, fuel supply hose and, or start pump wire.

(19). Install transmitter and repeat functional check.

(20). When 10 pounds (4.54 kg), 1.53 gallons (5.79 L) has been pumped, needle pointer should be aligned on center of the 35 pound red dot mark and **FUEL LOW** caution light should come on.

(21). Drain remaining fuel and observe that gauge needle falls to empty (E) as tank runs dry.

(22). Repeat adjustments as required. Additional adjustments to float arm or

low level contact wire requires a verification check and repetition of the entire check procedure sequence.

(23). Connect fuel supply hose to engine inlet port. Torque hose nut to **230 - 260 inch-pounds (25.99 - 29.38 Nm)**.

(24). Install quantity transmitter (Ref. Fuel Quantity Transmitter Installation).

4. Fuel Filter (Bypass) Caution Light Pressure Switch Test

WARNING

- **Air in the fuel system will cause a power reduction or flameout. Do a fuel system vacuum leak check and system air bleed after opening fuel system to atmosphere and prior to releasing helicopter for flight.**
- **(Model 250-C20 Series Engines) Ensure start pump is operating before taking fuel samples from system supply line drain valves.**

(1). Set all switches; **OFF**. Disconnect external electrical power. Disconnect battery.

(2). Open engine access doors.

(3). Locate pressure switch on engine fuel pump filter (Ref. Figure 503, Figure 504 or Figure 505). Disconnect bypass switch wire knife splice.

CAUTION

- Pressure switch is easily damaged. A slight shearing force applied to half the pressure switch can cause leakage and, or operational failure. Always grip both halves of pressure switch hex flats with wrench when loosening or torquing attaching hardware.
- Bypass pressure switch is not field repairable. Do not disassemble switch. Return faulty switches to vender for repair.

NOTE: For all torques in the following procedures, refer to Figure 503, Figure 504 or Figure 505.

(4). Disconnect hose from from switch bushing. Cap hose.

(5). Remove fuel pressure switch with bushing intact from after filter (AF) port adapter. Install an O-ring on a suitable airtight plug and tighten into adapter fitting.

(6). Bench test 369H8144 bypass pressure switch as follows (denoted by three housing screws):

(a). Assemble test equipment shown in Figure 502. Connect tester to pressure switch lead and connect ground test lead to one of three screws on the housing body.

(b). Remove bushing and O-ring from switch. Attach tubing to switch inlet port as shown. Wipe switch completely dry so any leakage can be detected during the test.

(c). Add fuel to tube. Ohmmeter must indicate switch contact closure as fuel column height passes between 24.5 and 35.0 inches (62.23 and 88.90 cm).

(d). Check switch for leakage around diaphragm. No leaks allowed. Replace a leaking switch.

(e). Separate switch from test apparatus.

(f). Install new O-ring and bushing on switch. Torque switch bushing.

(7). Bench test 369D28144 bypass pressure switch as follows (denoted by six housing screws):

(a). Assemble test equipment shown in Figure 502. Connect tester to pressure switch lead and connect ground test lead to one of six screws on the housing body.

(b). Pressure Method:

1). Remove bushing and O-ring from switch. Attach tubing to switch port A as shown. Tubing has to be airtight.

2). Add pressure to the tube. Ohmmeter must indicate switch contact closure as pressure passes between 8 – 9 psig (16.3 – 18.3 in. hg.).

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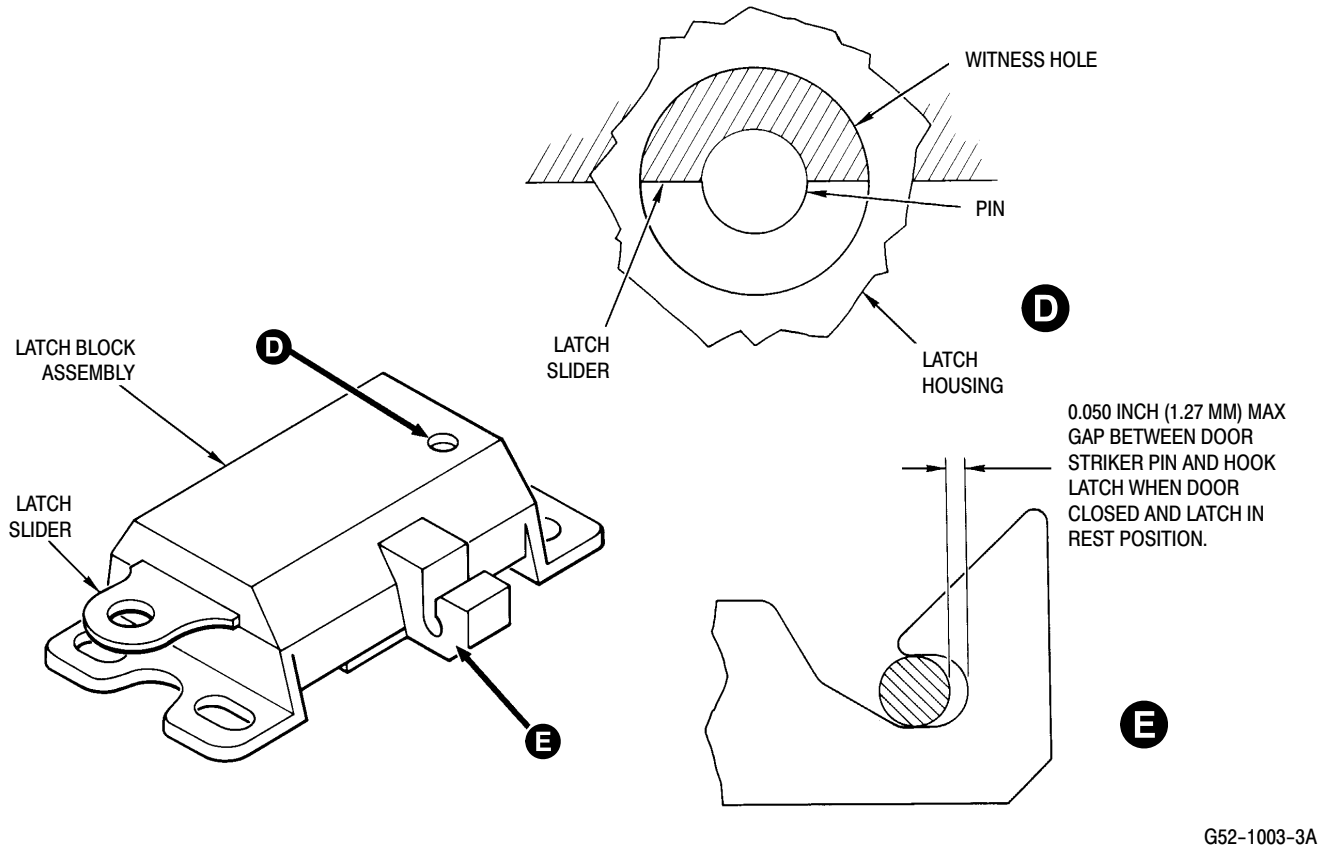


Figure 203. Door Handle Positions and Latch Engagement (Sheet 3 of 3)

(3). Check latch blocks, latch sliders, door waffle and striker pin assemblies for any nicks, dents, scratches, chipped paint or other evidence of contact caused by misalignment of door latches or striker pin assemblies.

NOTE: Extreme temperatures may cause door seal to swell or door seal-to-door frame bonding failure. Door seal protrusions caused by swelling or bonding failure may interfere with latching function.

(4). Check door seal and repair as required.

(5). Close door firmly from inside helicopter. Check that all four latch hooks engage their striker pins and that there is not more than 0.050 inch (1.27 mm) between each hook and striker pin.

(6). Move handle to lock (full down). With door locked, use flashlight to check witness hole on each latch block. Note that semi-circle cutout on latch slider is fully seated around pin on latch block.

(7). Move handle to open. Note that all four latch hooks extend fully from their latch blocks and fully disengage their striker pins, allowing the door to open. Handle should spring back to rest position when released.

15. Autolatching Pilot and Cargo Doors Operational Check

NOTE: When opening door, apply light inward force on door. This reduces wear of latching mechanism by overcoming door seal pressure.

(1). Open and close door to check for smooth operation of handles and latch mechanism. Check operation of door stop.

(2). Close door from inside. Check all inside latches for correct engagement at latch and safelock positions of interior and exterior handle. (Ref. Figure 203).

(3). Check that setting interior and exterior handles to safelock position pulls door inward for proper closure and sealing.

(4). Check that key locks and unlocks door handle.

16. Door–Latching Mechanism Inspection (All Systems)

(Ref. Figure 202 and Figure 203)

Make following checks with magnification glass and strong light:

(1). All parts for excessive wear, nicks, cracks and corrosion.

(2). Threaded parts for worn, crossed or otherwise damaged threads.

(3). Early latch block assemblies for broken springs and wear on strike contact surfaces of latching bolts; and for undue wear of latch sliders, bolts and bolt rollers. Current latch block assemblies for wear, damage or distortion of latch sliders and latch hook.

(4). Cam lock for jamming when key is operated.

(5). Link for wear or distortion.

(6). Handles for distortion, worn pivot holes and worn finish.

(7). Escutcheon and handle for looseness, distortion, thread damage and breakage.

(8). Lockplate assembly for wear, distortion, thread damage and breakage.

(9). Latch block nutplates for thread damage and loose rivets.

(10). Rods and clevis for wear in clevis pin holes, thread damage, and distortion.

17. Anti–Chafing Tape on Door Frame Repair

(Ref. Figure 208) Inspect condition of anti-chafing tape installed on pilot's and cargo compartment door frames. For minor repair, remove defective tape where necessary. Clean frame surface with MEK (CM219). Replace with polyurethane pressure-sensitive tape (CM717).

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM219	Methyl-ethyl-ketone
CM717	Tape, pressure sensitive

18. Window Replacement

A. Early Style Window Replacement

(Ref. Figure 205) For repair of plastics refer to FAA AC 43.13-1A. Replace window as follows:

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM415	Cement
CM418	Cement, epoxy
CM425	Sealing compound
CM432	Dichloromethane
CM433	Ethylene chloride
CM717	Tape, pressure sensitive

(1). Remove snapvent from window (Ref. Snapvent Replacement).

(2). Drill out rivets attaching window retainers to door structure and remove window. Remove two screws, washers and nuts from door hinge doubler.

(3). If door frame or window is to be reused, carefully scrape off sealant around edge of door or window frame using a wooden, plastic or other suitable nonmetallic scraper.

(4). Repair retainer-to-window bond, if applicable, with dichloromethane (CM432) or ethylene chloride (CM433); or use PS-18 or S147 cement (CM415).

(5). Trim retainer as required to provide clearance for door handle and end butt joint.

(6). Place window in position and check for 0.380 inch (9.652 mm) minimum engagement and flush fit with window frame. Trim excess if required.

(7). Use 1/2 inch (12.70 mm) pressure-sensitive tape (CM717) on edge of window. Bond seals to retainer and to door

frame using cement, epoxy (CM418); bond inside of seals to window using sealant (CM425). Do not stretch seals when bonding.

(8). With retainer and window in position on door frame, press down firmly and evenly on retainer so that seals are compressed tightly against window around full circumference of door frame.

(9). Locate existing holes in door-reinforcing frame. Mark and drill holes in retainer. It is permissible to install new rivets between existing holes in rivet pattern.

(10). Rivet window to door using rivets of correct length. Blind rivets are used for retainers riveted to door reinforcing frame.

(11). Install doubler over retainer at hinge area with two screws, washers and nuts. Drill (No. 21 drill) and ream to 0.166 inch (4.216 mm) diameter window panel for screws, using slow speed drill (700-800 rpm).

(12). Install snapvent (Ref. Snapvent Replacement).

(13). Remove protective covering and clean window (Ref. Sec. 20-20-00).

B. Current Style Window Replacement

(Ref. Figure 206)

(1). Using a blunt plastic spatula or probe, pull back edge of window seal and gradually work window out from groove in seal.

(2). Remove seal and clean for re-installation of window, discard if not pliable.

(3). Mask around new glass for marking.

(4). Place new glass against door and center over the window opening.

(5). Trace line on glass from window opening in door.

NOTE: The following step is to ensure the glass is larger than the door opening so glass will not blow out in flight.

(6). Apply 0.250 inch (6.35 mm) tape around outside of drawn line.

(7). Trim glass to the outside of applied 0.250 inch (6.35 mm) tape.

(8). Remove tape and gently smooth the edges.

NOTE:

- It is best to have ends of seal on aft side of window to help keep moisture out while in flight.
- Ensure seal is firmly worked onto door to prevent seal from being cut too short.

(9). Install window seal around periphery of window opening with groove for glass to the inside. Cut seal to size if new.

(10). Gently trim seal, where needed, around top door hinges.

CAUTION Do not use any tools with sharp edges to aid in installing glass into seal, glass is easily damaged.

NOTE: To aid in installation of glass into seal, use a mild mixture of soapy water liberally applied to the edge of the glass and into groove in seal. Do not use any lubricants.

(11). Install glass from inside by sliding up into the seal.

(12). With hands on either side of glass, work glass firmly into seal.

(13). Using a blunt plastic spatula or probe, gradually work edge of window into groove of window seal.

(14). If there is a gap at the seal ends, use commercially available clear silicone seal to fill gap.

19. Hinge Replacement

(Ref. Figure 204)

(1). Remove door and drill out hinge-attaching rivets.

(2). Install replacement hinges at body attach points with door hinge pins.

(3). With damaged hinges removed, install doors in closed position. Have an assistant retain door in place by actuating door handle locking levers.

(4). If required for door fit, use one-piece solid aluminum alloy shim, up to 0.040 inch (1.016 mm) maximum thickness trimmed flush with hinge outer edges, under upper or lower hinge (between hinge and door exterior).

(5). Mark hinge rivet attach locations through existing holes in door. Locate and mark blind rivet attach points (cargo door only).

(6). Remove door hinges and check for proper edge distance.

(7). Drill holes with a No. 28 drill at pilot's door upper and lower hinge aft attach points. Use a No. 21 drill at all other pilot and cargo door attach points.

(8). On pilot's door upper hinge, install rivets with washers under bucked heads.

(9). Install rivets at remaining pilot's door attach points.

(10). Install two mechanically-expanding rivets at aft cargo door hinge attach points.

(11). Install four rivets at remaining attach points.

(12). Paint as required.

(13). Install doors and perform an operational check (Ref. Automatic Latching Mechanism (Early System) Operational Check).

A. Preload Spring Replacement

(Ref. Figure 205)

Consumable Materials
(Ref. Section 91–00–00)

Item	Nomenclature
CM424	Sealing compound

NOTE: The following procedures apply to both upper and lower hinges.

(1). Remove two cotter pins and clevis pins.

(2). Remove door spring first; then remove preload spring.

(3). Replace preload spring; with longest flat area outboard and aft in hinge body recess.

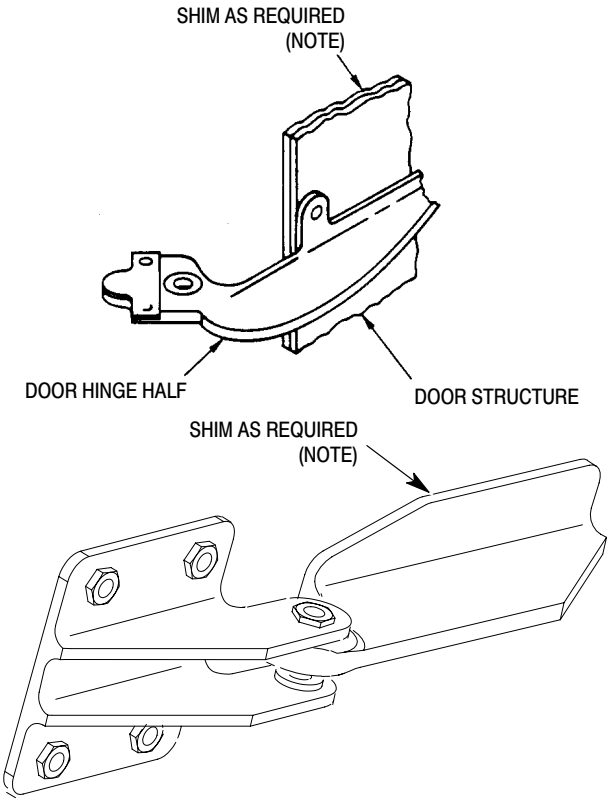
(4). Replace door spring; with longest flat area also outboard and aft in body hinge recess.

NOTE: Forward curved area of door hinge presses against preload spring inboard curved area, at installed position.

(5). Install hinge pins and cotter pins. Pins may be installed upward if interference does not permit installation with cotter pin hole down.

(6). Cover exposed sharp edges of cotter pins and pins with sealer (CM424).

(7). Install doors and perform operational check (Ref. Automatic Latching Mechanism (Early System) Operational Check.



NOTE: SHIM AS REQUIRED UNDER HINGE WITH ONE PIECE OF 2024-T3 ALUMINUM, 0.050 IN. (1.270 MM) MAXIMUM. TRIM TO OUTER PERIPHERY OF HINGE.

G52-1004

Figure 204. Door Hinge Replacement

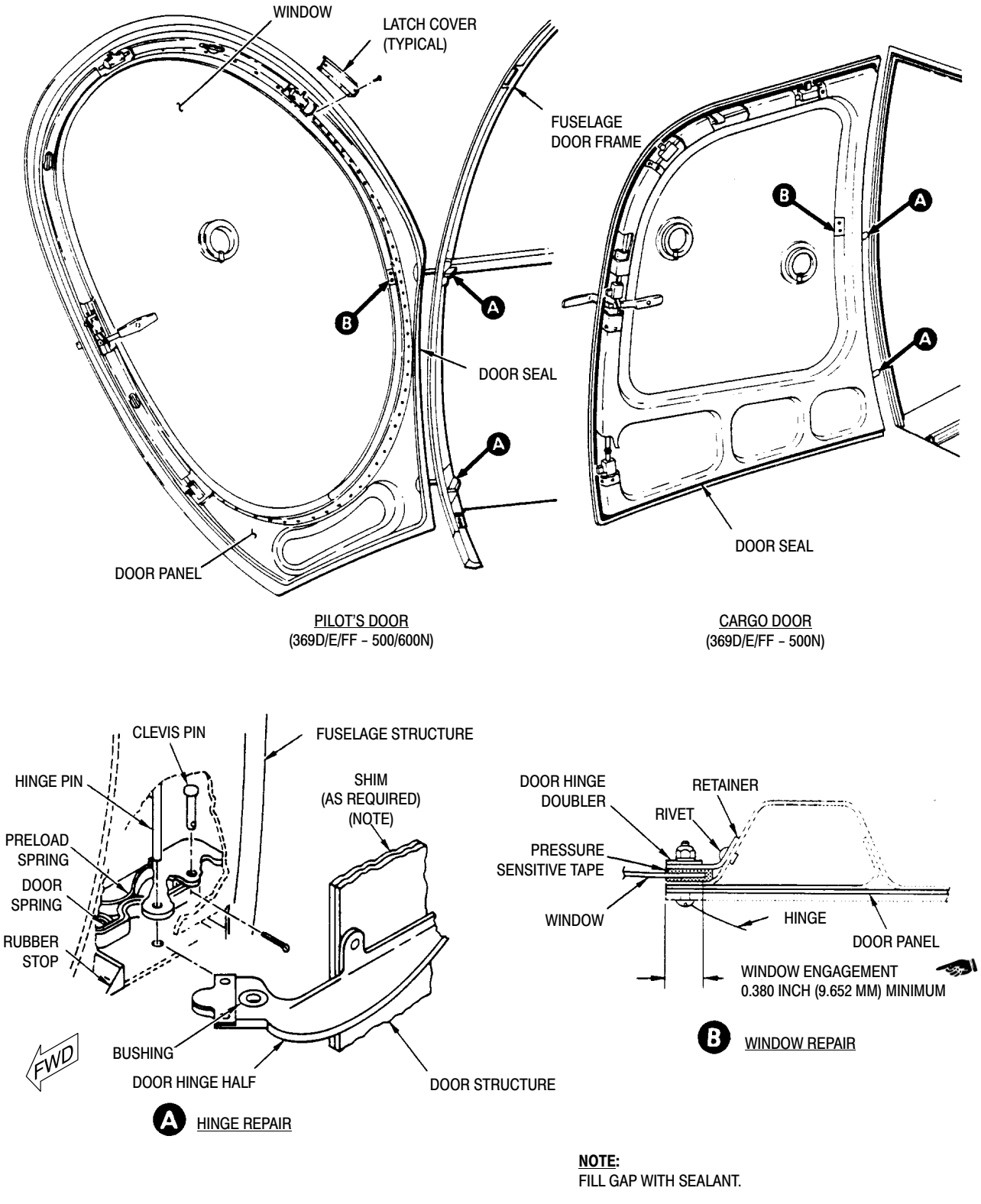
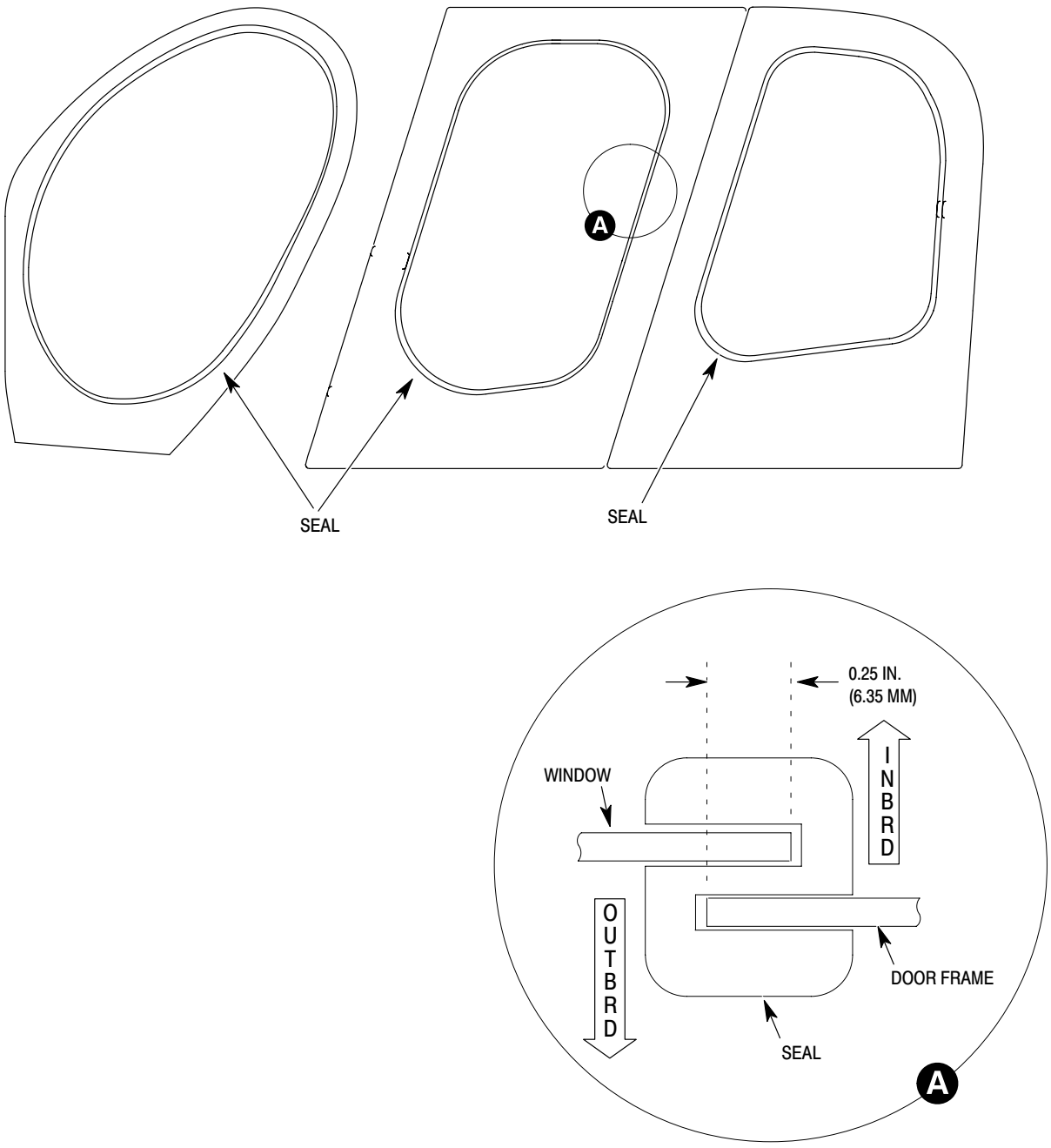


Figure 205. Window and Hinge Repair



NOTE: 600N SHOWN, TYPICAL OF ALL HELICOPTERS.

G52-1001-4

Figure 206. Current Style Window Installation

B. Rubber Stop Replacement

(Ref. Figure 205) Replace rubber door stop if damaged or partially separated. Remove door stops by carefully prying bonded rubber out of hinge recess. Bond new stop to forward end of hinge recess with adhesive (CM411).

Consumable Materials
(Ref. Section 91–00–00)

Item	Nomenclature
CM411	Adhesive, epoxy

20. Automatic Latch Block Assembly Repair

(Ref. Figure 201 and Figure 207, Sheet 1 of 2) Replace worn or damaged parts as necessary. Disassemble only to extent required for replacement of parts. Perform following steps as required:

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM108	Graphite, powdered
CM118	Grease
CM234	Solvent, dry-cleaning
CM307	Lacquer, acrylic semi-gloss

(1). Lubricate all moving parts except lock, with grease (CM118) to prevent binding.

(2). Lubricate lock with powdered graphite (CM108).

(3). At time of disassembly clean reusable parts except locks, using soft bristle brush dipped in solvent (CM234).

(4). Dry parts using clean, lint-free cloth or dry compressed air at 20 psi maximum.

(5). Clean key-operated cam locks, using dry compressed air at 20 psi maximum.

(6). Touchup handles with semigloss black acrylic lacquer (CM307).

(7). Eliminate binding by lubricating moving parts.

21. Strike Pin Repair

(Ref. Figure 207)

NOTE: The 369 model has three different configurations. Select the configuration that pertains to your specific application.

(1). Remove screws, strike pin, dam (if applicable), shim and washers (if applicable) from door frame.

(2). Replace anti-chafing tape if damaged.

(3). Install washer (if applicable), shims, dam (if applicable), strike pin and secure with screws.

22. Litter Door Inspection (50 Hour)

The following is a procedure for inspecting the litter door installation for proper condition and security of the quick-release fastener assemblies and the rubber seal (gasket) installed between the window glass and door frame. The visual inspection is applicable to the PN 369H92733-1 / -2 bubble window assemblies (or PN 369H92731-1 / -2 flat window assemblies, if installed) in the PN 369H90085 litter door installation.

(1). Remove quick-release fasteners securing bubble (or flat) windows to litter doors.

(2). Visually inspect each fastener for condition, and each anchor receptacle in door structure for condition and security of attachment.

(a). Replace each fastener if stud is loose or worn.

(b). Replace anchor receptacle and/or rivets as required.

(3). Visually inspect rubber seal (gasket) on window assemblies for condition. Seal must be fully intact; rebond seal to door structure as required.

(a). Replace seal if worn, cracked or hard.

(4). Reinstall window assemblies to litter doors using quick-release fasteners.

(5). Check for gaps between window glass, rubber seal and door structure.

(6). Replace seal and/or use shorter length studs if any gap is noted.

(7). If seal is extruded, use longer length studs; replace seal if extrusion still exists.

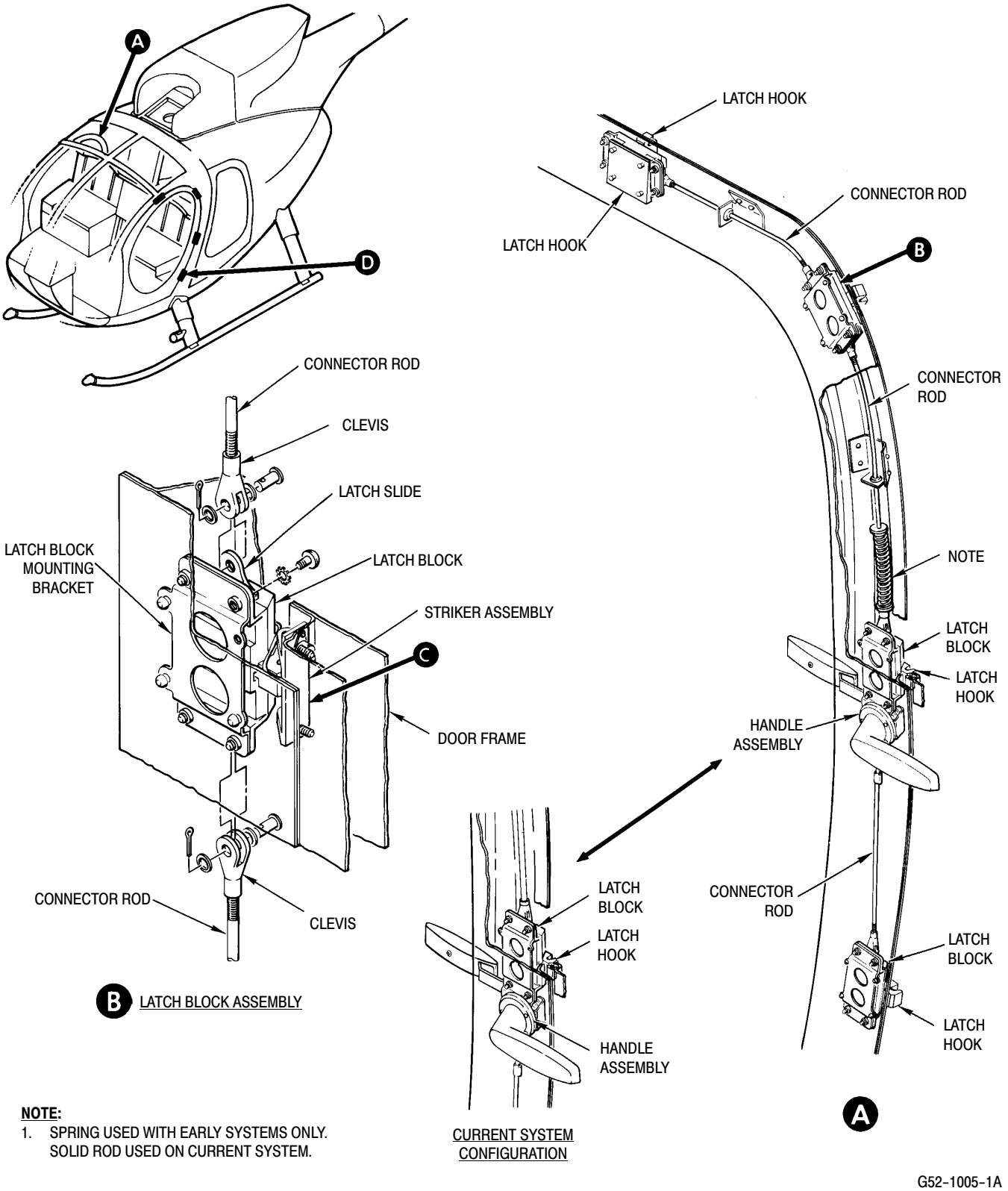


Figure 207. Automatic Latch Block and Striker Repairs (Sheet 1 of 2)

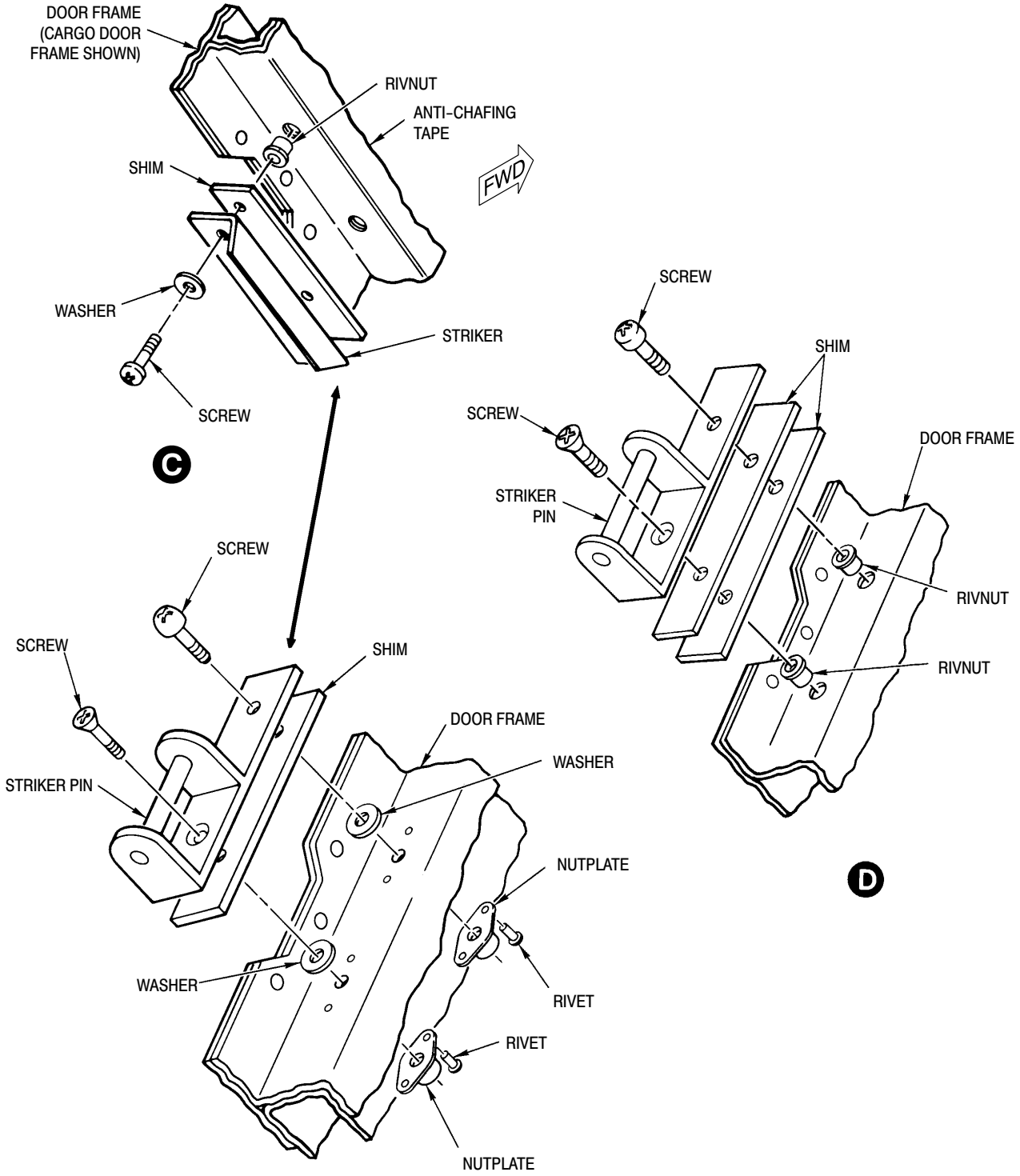
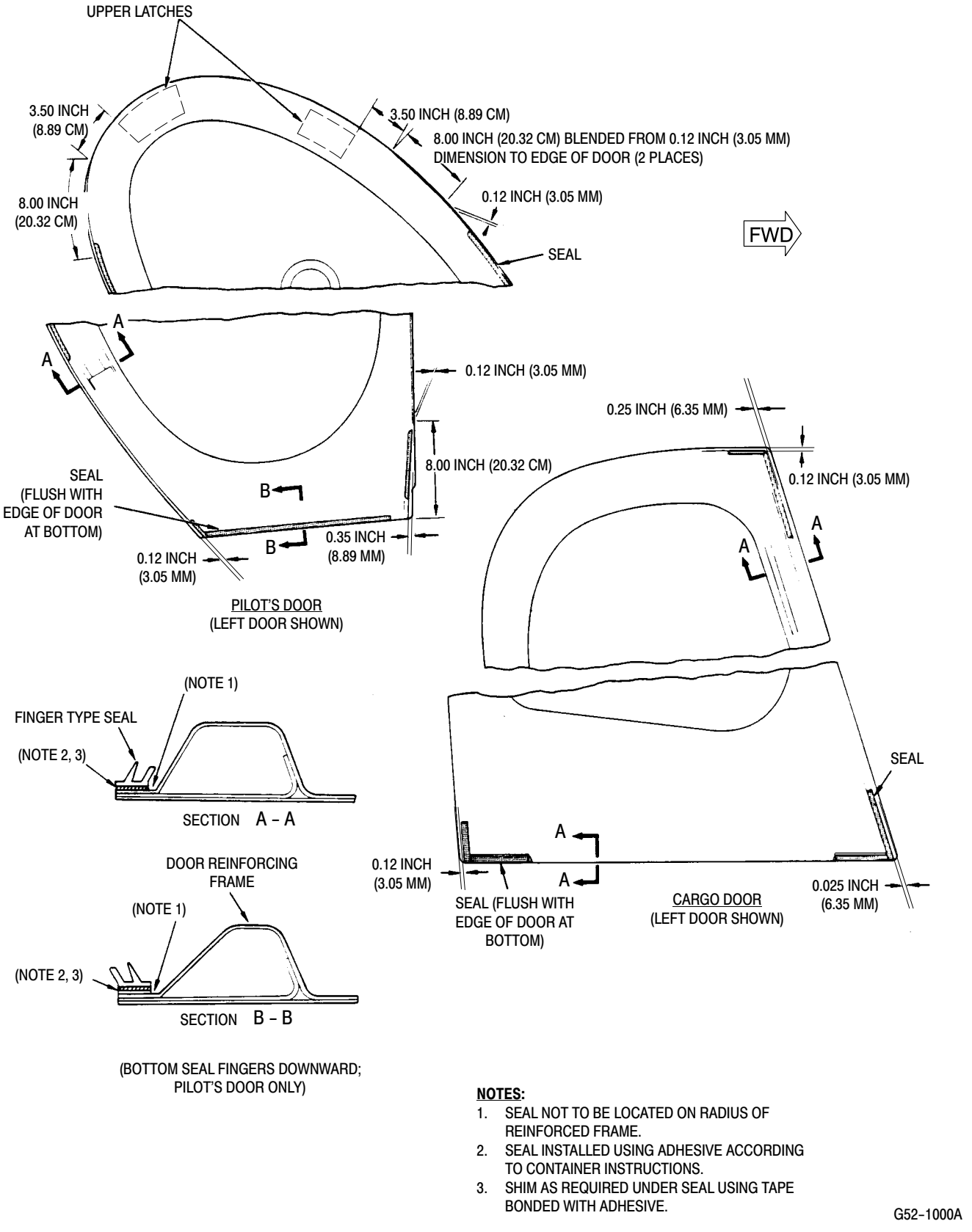


Figure 207. Automatic Latch Block and Striker Repairs (Sheet 2 of 2)



NOTES:

1. SEAL NOT TO BE LOCATED ON RADIUS OF REINFORCED FRAME.
2. SEAL INSTALLED USING ADHESIVE ACCORDING TO CONTAINER INSTRUCTIONS.
3. SHIM AS REQUIRED UNDER SEAL USING TAPE BONDED WITH ADHESIVE.

G52-1000A

Figure 208. Door Seal Repair

23. Pilot and Cargo Door Repair

A. Seal Repair

(Ref. Figure 208)

Consumable Materials (Ref. Section 91–00–00)	
Item	Nomenclature
CM418	Cement, epoxy

(1). Carefully pull or scrape away damaged seal.

(2). Restore chemical film protection to any base metal exposed during cleaning process (Ref. Sec. 20-20-00).

(3). Clean seal contact area on metal and rubber seal.

(4). Carefully align and bond seal to mounting surface with cement, epoxy (CM418) according to container instructions.

NOTE: Correct seal mounting position results in an approximately 0.060 inch (1.52 mm) interference fit between door seal and bumper.

B. Partially–Separated Seal Repair

(Ref. Figure 208)

Consumable Materials (Ref. Section 91–00–00)	
Item	Nomenclature
CM220	Naphtha aliphatic
CM418	Cement, epoxy

(1). Clean separated area with naphtha (CM220) and allow to dry for minimum of 20 minutes.

(2). Apply one uniform brush coat of cement, epoxy (CM418) to rubber seal and mating surface contact area. Allow to dry for 5 minutes and press mating surfaces together.

24. Improved Door Seal Installation

(Ref. Figure 209) The following procedure is for installation of QGR2178 door seals on the cargo/passenger doors.

Consumable Materials (Ref. Section 91–00–00)	
Item	Nomenclature
CM220	Naphtha aliphatic
CM235	Cleaner
CM322	Primer, Silicone, Red
CM414	Adhesive, cyanoacrylic / Accelerator
CM439	Adhesive

(1). Remove existing door seals using Desoclean 45 (CM235) or naphtha aliphatic (CM220). Ensure that all surfaces are clean to allow proper adhesion of new seal material. Allow surface to air-dry a minimum of 15 minutes.

NOTE:

- On the 369D/E/FF - 500N helicopters, seals are to be installed around the entire circumference of the aft doors.
- On the 600N helicopters, seals are to be installed around the entire circumference of the mid doors. Seals are to the applied to the top, bottom and aft edges of the aft-cabin doors.

(2). Prime seal faying surface with red silicone primer (CM321) and allow to air-dry a minimum of 15 minutes.

(3). Apply a thin uniform coat of adhesive (CM439) to faying surface of door and seal. Allow to air-dry a minimum of five minutes.

(4). Apply a second thin uniform coat of adhesive to faying surface of door and seal. Allow to air-dry a minimum of five minutes.

(5). Test glue with clean knuckle. If adhesive does not transfer to knuckle, press the seal into place.

(6). Butt joints at forward and aft lower locations.

(7). Maximum gap of 0.030 inch (0.762 mm) at butt joints.

(8). Miter joints at upper locations.

(9). Bond mitered joints with adhesive (CM414).

NOTE: Use glue very sparingly to achieve best bond.

(10). Trim seal flush with edge of door.

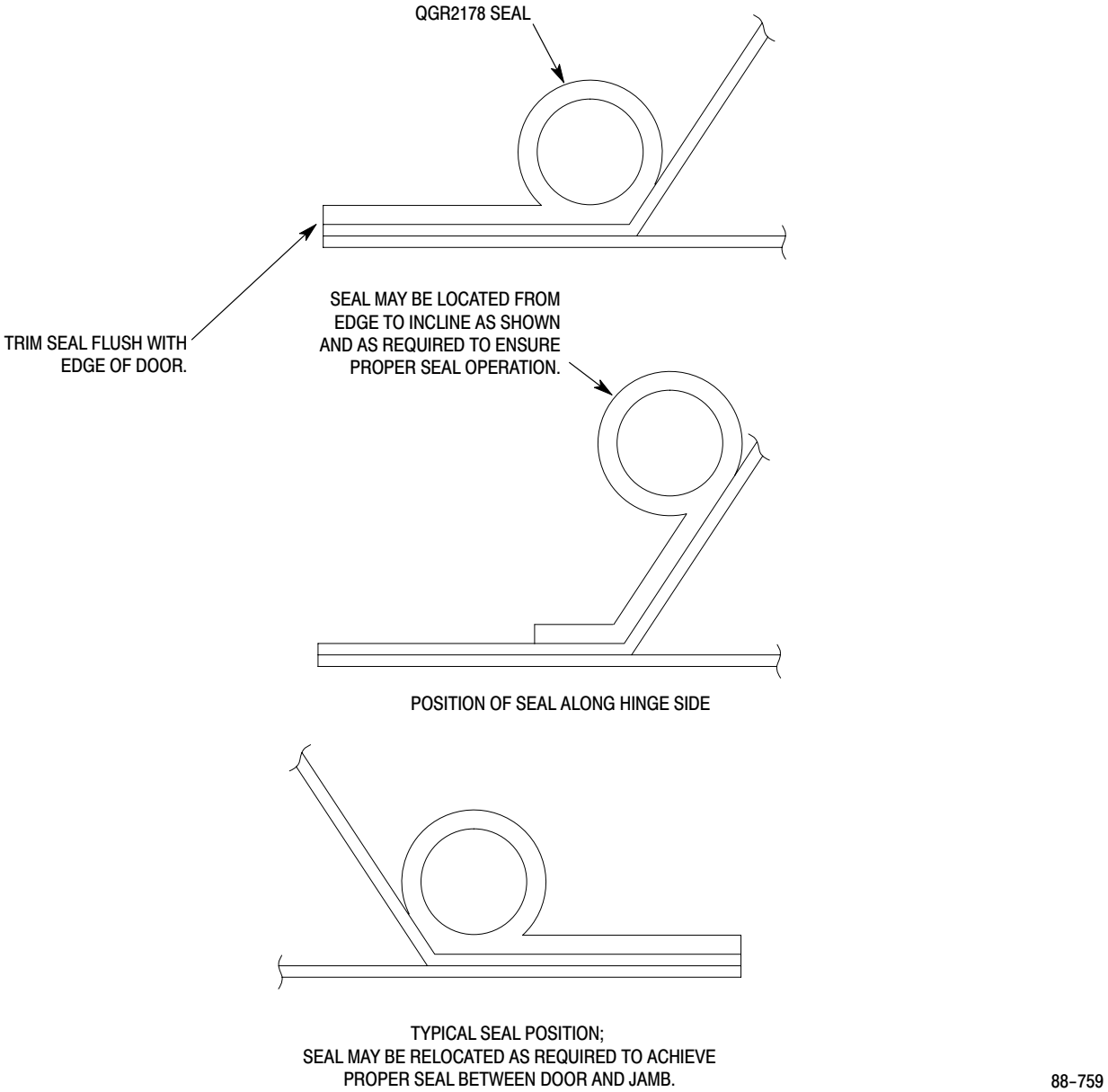


Figure 209. Improved Door Seal Installation

TAILBOOM (500/600N)

MAINTENANCE PRACTICES

1. Tailboom Description

(Ref. Figure 201) The tailboom assembly is a fully monocoque construction of graphite composites, it provides directional control for the helicopter.

The tailboom for the Model 600N helicopter is a similar version to that on the Model 500N helicopter. One of the obvious differences is the length, approximately 28 inches (71.12 cm) longer on the 600N. Also, two of the four mounting bolts that hold the boom to the fuselage are a larger diameter. These two points have been reinforced both on the boom and on the fuselage for added strength.

(1). The tailboom converts energy from the main rotor downwash to an anti-torque force. In order to accomplish this, a variable pitch fan pushes low pressure air through two longitudinal slots on the right side of the tailboom and two thrusters ports at the end of the tailboom. These slots located at 130° and 76° degrees, direct low pressure air downward over the tailboom surface.

(2). Slot air flow mixes with main rotor downwash air, delaying its separation at the bottom of the tailboom and effectively creating a lifting force.

(3). Air from the main rotor passing over the boom provides directional control to neutralize the main rotor torque.

(4). Approximately 60% of the anti-torque force required in a hover, is provided by the tailboom lift, the remaining 40% is by metered air flowing out the end of the tailboom rotating thruster cone.

(5). A stationary thruster cone port directs air flow to the left or to the right.

(6). The rotating thruster cone (a can-shaped structure) meters exit air for left or right directional control.

(7). Pedal movement opens and closes the thruster cone ports and changes fan blade pitch angle for engine power changes.

(8). A Strake, a composite strip bonded to the left side of the tailboom, breaks up airflow on the left side of the boom for hovering stability.

(9). A Stator located directly behind the fan and mounted inside the tailboom straightens low pressure air flowing through the boom. The stator has eleven composite removable blades, and is accessible by removing the tailboom.

(10). A tail skid mounted bottom aft on the tailboom is constructed of aluminum tubing.

(11). A jack pad is located on the tailboom underside. The jackpad can be accessed by removing the tail skid.

(12). The tailboom provides for the mounting of the horizontal stabilizer and a control cable conduit for the flight controls.

2. Tailboom Replacement

(Ref. Figure 201)

NOTE: When removing tailboom as an assembly with the horizontal and vertical stabilizers installed, precaution should be taken to adequately support and balance the tailboom assembly equally due to the mass of the stabilizers.

A. Tailboom Removal

(1). Remove tailboom fairing.

(2). Disconnect the forward end of the anti-torque control cable by turning outside collar sleeve counter-clockwise and back to expose the inner cable. Apply sufficient right pedal to expose engagement pin and pull collar sleeve outward.

(3). Disconnect electrical connector.

(4). Have assistants support tailboom.

(5). Remove four mounting bolts and washers and remove tailboom. Inspect bolts for corrosion.

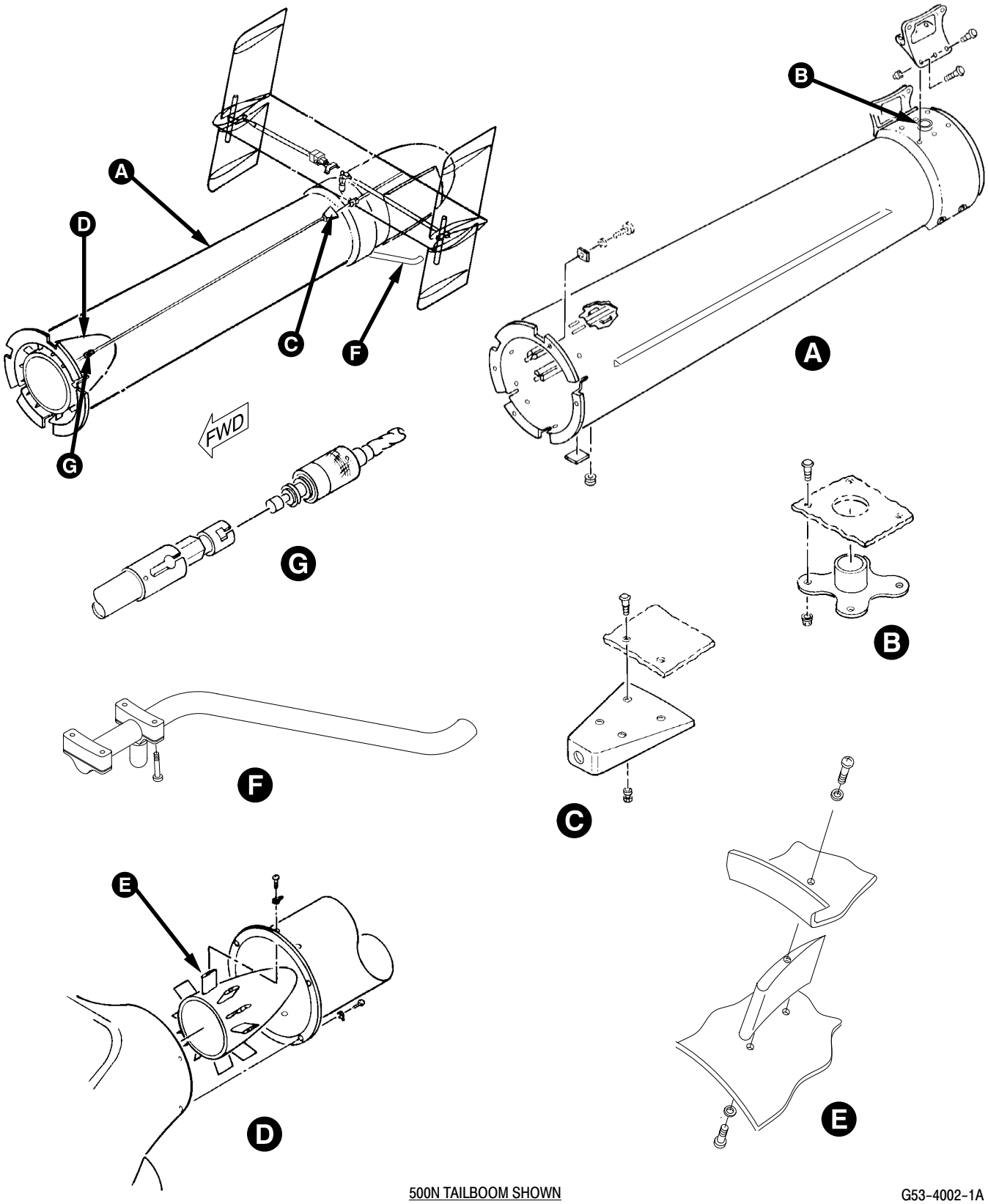


Figure 201. Tailboom Assembly (Sheet 1 of 3)

B. Tailboom Installation

CAUTION Before tailboom installation, inspect radius blocks for brinneling, corrosion, cracks and indication of indent on face; none allowed.

NOTE: If installing a new tailboom, the 500N3500-5 cover will have to be installed after internal tailboom components are installed (Ref. 500N3500-5 Cover Installation).

(1). Support tailboom so that the mating bulkhead surfaces are flush.

(2). Slide countersunk/chamber washers on external wrenching bolts with countersunk side facing bolt head.

CAUTION If washers are installed backwards, structural failure may result due to insufficient surface in load bearing area that can cause spreading or cracking of washers and result in loss of clamp-up torque.

(3). With the tailboom supported in place, install four bolts with washers.

(a). 500N:

Torque bolts to **130 - 150 inch-pounds (14.69 - 16.95 Nm) plus drag torque**. Verify minimum run on torque of 6.5 inch-pounds (0.73 Nm).

(b). 600N:

RN003 - RN059 without TB600N-007 complied with; torque the two smaller diameter bolts to **130 - 150 inch-pounds (14.68 - 16.94 Nm) plus drag torque** and the two larger diameter bolts to **180 - 220 inch-pounds (20.33 - 24.85 Nm) plus drag torque**. Safety bolts.

RN003 - RN059 with TB600N-007 complied with and RN060 & subs; torque bolts to **180 - 220 inch-pounds (20.33 - 24.85 Nm) plus drag torque**. Safety bolts.

(4). Re-connect electrical connectors.

(5). Re-connect control cable assembly.

(6). Install tailboom fairing.

3. Tailboom Inspection

(Ref. Figure 201)

(1). Inspect tailboom exterior as follows:

(a). Inspect tailboom fairing for cracks and delaminations.

(b). Inspect tailboom flange and mounting bolt holes attachment area for cracks at Sta. 168.20.

(c). Inspect radius blocks for brinneling, corrosion and indication of indent on face; none allowed. If found, scrap radius block and install new radius block.

(d). Inspect strake for cracks, delaminations, debonding, dents, nicks and separation.

NOTE: Damage to slots can cause significant degradation of aircraft performance in a hover.

(e). Inspect tailboom surface area and tailboom circulation control slots surface area for cracks, voids, dents, holes, scratches, separation, delaminations at tailboom and security.

1). Using a bright light, inspect fore and aft radii of the lower portion of the three upper slot bridges for cracks, illuminate area under the flap.

NOTE: The flap may be raised slightly, using finger pressure only, to aid in checking this area.

(f). Inspect flaps for cracking and debonding (Ref. Figure 202):

1). A crack of any length, in line with aft edge of flap, is permissible at interface between flap and tailboom.

2). A crack of 1.25 inch (3.175 cm) maximum length, in line with the forward edge of flap, is permissible at interface between flap and tailboom.

NOTE: If crack in forward edge of flap is longer than 1.25 inch (3.175 cm), contact your local MDHI Field Service Representative for disposition.

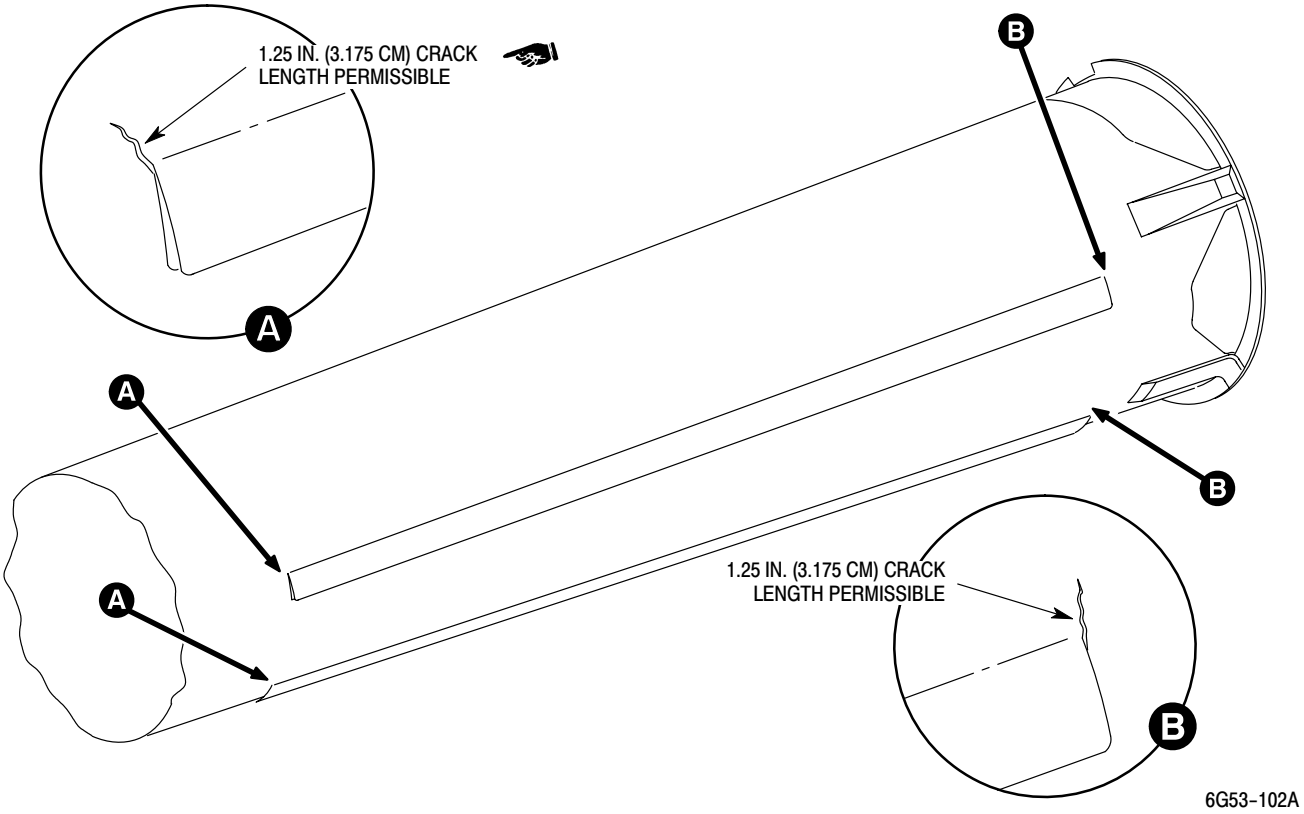


Figure 202. Tailboom Flap Inspection

(g). Inspect horizontal stabilizer mounting brackets (pay particular attention to the forward inboard legs) and attachment fittings for cracks, voids, separation and delamination.

(h). Inspect stabilizers (Ref. Sec. 53-50-30).

(i). Inspect (tail-skid) for cracks, dents, holes and delamination.

(j). Inspect rotating thruster cone for freedom of operation, cracks, holes, separation and delamination.

(k). Inspect tailboom grommets (2) places for cracks and proper fit.

(2). Inspect tailboom interior as follows:

(a). Check stator vanes and stator diffuser cone for cracks, delaminations and separation.

1). Maximum allowable cracks found emanating from stator vane inserts should not exceed 0.10 inch (2.54 mm) span-wise.

2). No cracks allowed running cord-wise towards leading or trailing edge

(b). Inspect slot air foils for cracks, delamination and separation from boom.

(c). Inspect control cable assembly attachment points for looseness, cracks and condition.

(d). Inspect cable conduit for cracks, separation and delamination.

(e). Inspect air circulation area for FOD and cleanliness. If necessary, clean with mild soap and water.

(3). Inspect rotating thruster cone collar strap ring rivets for looseness, strap for cracks and condition.

4. Tailboom Repair

There are no repair procedures for the tailboom at this time. Refer to MDHI Field Service Representative.

5. Stator Replacement

(Ref. Figure 201, View D)

MAIN ROTOR HUB

REMOVAL/INSTALLATION

1. Main Rotor Hub – General

The main rotor hub consists of a central hub, five identical pitch housings spaced 72 degrees apart horizontally around the hub with associated mechanisms and linkages.

Lead-lag links, a lead-lag damper, a droop stop striker strip and spacer, and a pitch control bearing with each pitch housing produce the pivoting axis, blade flapping stop contact surfaces and lead-lag hinge function for the rotor blades.

Five laminated retention strap assemblies that are flexible both vertically and torsionally extend through the pitch housings and connect to the lead-lag links.

A lower shoe, attached to the central hub, contains a droop stop ring and droop restrainers that support the blades at rest and distribute droop loads at low blade rpm.

The following instructions provide field maintenance and repair procedures for the main rotor hub.

2. Main Rotor Hub Replacement

A. Main Rotor Hub Removal

(Ref. Figure 401)

Special Tools (Ref. Section 91–00–00)

Item	Nomenclature
ST201	Hoisting adapter
ST701	Main rotor wrench assembly
ST702	Hub puller

(1). Remove all main rotor blades.

(2). Remove main rotor drive shaft; then reinstall hoisting eyebolts, washers and nuts in rotor hub. Locate them to correspond with lugs of hoisting adapter (ST201).

(3). Remove lockwire and disconnect flexible boot from lower end of hub liner.

(4). Disconnect each pitch control rod from pitch housing.

(5). Disconnect scissors crank from main rotor hub or scissors link.

NOTE: To facilitate assembly, color code each pitch control rod to match pitch housing to which it is attached.

(6). Remove two screws securing retainer to main rotor hub nut.

(7). Remove nut retainer.

(8). Using main rotor mast nut wrench (ST701), remove nut from mast.

(9). Using hub puller (ST702), break loose main rotor hub (Ref. Figure 401). Remove hub puller.

(10). Attach hoisting adapter, to eyebolts and hoist hub from mast.

B. Main Rotor Hub Installation

(Ref. Figure 402)

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM111	Grease, aircraft
CM115	Grease, oscillating bearing
CM204	Compound, corrosion preventative
CM702	Lockwire CRES

Special Tools (Ref. Section 91–00–00)

Item	Nomenclature
ST201	Hoisting adapter
ST701	Main rotor wrench assembly
ST703	Main rotor hub driver

CAUTION Main rotor hub is a highly stressed component. Use extreme care to prevent it from striking any object. Any impact damage may require replacement of hub.

NOTE:

- Removal of recessed spacer, upper bearing cone, upper seal and seal retainer is not mandatory for installation of the main rotor hub. If these items are installed, perform steps (1). thru (4). and (11). thru (22). Caution should be used when installing hub to prevent damage to these parts.
- If recessed spacer, upper bearing cone, upper seal and seal retainer have been removed, these parts should not be assembled in hub before installation of hub on helicopter. These items are reassembled in hub after seating hub on mast. Prior to installing main rotor hub, insure that all bearings are adequately serviced with grease (CM111).
- Replacement main rotor hubs do not come balanced from MDHS. If installing a replacement hub, perform a main rotor hub balance (Ref. Sec. 18-10-00, Main Rotor Hub Balance Procedure).

(1). Attach hoisting adapter (ST201) to eyebolts in main rotor hub and connect suitable hoist.

CAUTION If hub assembly (with sleeve bushing, spacer, upper bearing and seal retainer installed) does not seat properly onto mast, do not attempt to force it into position. Remove hub assembly from mast and determine cause of hub not seating, correct the problem and follow the procedures for reinstallation.

(2). Check that rotor mast is clean. Hoist main rotor hub and position over mast; then lower hub onto mast.

NOTE: To inhibit mast corrosion when operating in salt water environment, lightly coat bearing journals of mast with grease (CM115).

(3). Remove adapter, hoist and eyebolts.

(4). Check that hub is fully seated on mast.

(5). Hand-pack hub cavity, between sleeve bushing and hub, with grease (CM111).

(6). Place recessed spacer, recess down, on top of sleeve bushing.

(7). Hand-pack upper bearing cup and cone with grease; then install cone on mast and use hub drive tool (ST703), to fully seat cone.

(8). Fill remaining cavity to upper seal with grease.

(9). Position upper seal in seal retainer with lip up; then press seal and retainer in hub counterbore.

(10). Using a soft drift, carefully tap seal outer ring to seat in counterbore. Wipe away any excess grease.

(11). Apply grease (CM111) to exposed threads on mast.

CAUTION Be sure that seal is properly positioned against seal retainer and that seal retainer does not pinch seal. Check by inserting a loop of approximately 0.050 inch (1.27 mm) diameter lockwire, round feeler gage or other suitable tool without sharp edges between seal lip and retainer.

NOTE: To insure that hub is seated onto mast properly before torquing, 2 - 4 threads should be showing above the mast nut with nut installed finger tight.

(12). Install mast nut, using wrench (ST701); torque nut to **200 foot-pounds (271 Nm)**. Apply coat of corrosion preventive compound (CM204) to screw holes in mast nut.

(13). Place retainer on nut and check retainer-to-nut screw hole alignment.

(14). Increase nut torque to not more than **250 foot-pounds (339 Nm)** to align holes in retainer and nut.

NOTE: If holes cannot be aligned in **200 - 250 foot-pound (271 - 339 Nm)** torque range, remove and invert nut and repeat procedures in (12). thru (14). to align holes.

(15). Secure retainer to nut with two screws; lockwire screws.

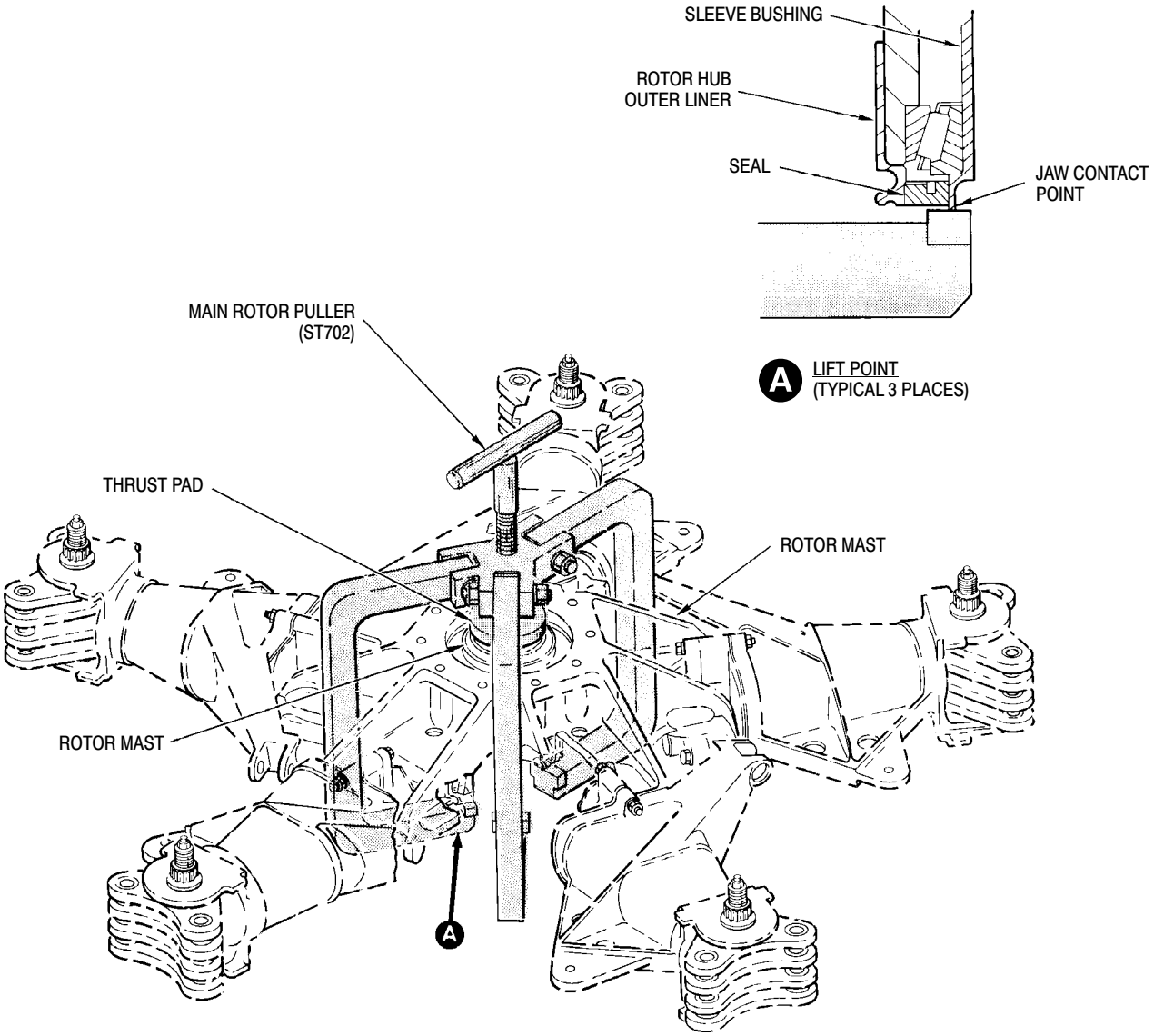


Figure 401. Pulling Hub Assembly

CAUTION Ensure that no washers are used under screwheads and that screwheads are free of burrs.

(16). Verify that screwheads do not project more than 0.020 inch (0.508 mm) above hub upper surface, for adequate clearance between screwheads and driveshaft flange.

(17). Connect scissors crank to main rotor hub lower shoe and/or to scissors link.

NOTE: Ensure pitch control rods are installed at same locations from which removed.

(18). Install five pitch control rods to pitch housings (Ref. Sec. 62-30-00, Pitch Control Rod Replacement).

(19). Connect flexible boot to lower end of rotor hub liner and secure with lockwire (CM702).

(20). Install main rotor drive shaft (Ref. Sec. 63-10-00).

(21). Install five main rotor blades.

(22). Perform main rotor blade droop angle check if hub is new or replacement.

(23). Perform main rotor hub balance (Ref. Sec. 18-10-00, Main Rotor Hub Balance Procedure) if a new or rebuilt hub is installed.

3. Main Rotor Damper

(Ref. Figure 603) A main rotor damper is attached to each pitch housing of the rotor hub. The damper is connected to the inboard trailing edge of the associated main rotor blade by an adjustable clevis to prevent lateral vibrations from occurring in main rotor blades. Neither damper travel nor stiffness is adjustable on the helicopter. Phasing of rotor blades is affected by turnbuckle adjustment. Any phasing problem caused by a defective damper should be corrected by replacing damper.

CAUTION Excessive lead-lag load applied to the main rotor blades during ground handling can result in damage to the elastomeric damper buns and failure of the damper assembly. Operators and maintenance personnel should use extra caution to avoid lead-lag loads in excess of **35 pounds (155.68 N)** at the tip of the main rotor blades.

NOTE:

- Refer to MDHS Notice DN-45.2 for information concerning required modification of dampers produced prior to October 1979. If lead-lag dampers, P/N 369D21400-501 are installed, they must be modified to M50452 or be replaced with P/N 369D21400-503 dampers.
- If one or more main rotor blades strike an object while rotating or the drive system has been subjected to sudden stop, inspect damper.

4. Main Rotor Damper Replacement

A. Main Rotor Damper Removal

(1). Note and record location from which damper is to be removed from main rotor hub.

NOTE: At reinstallation, if damper is not reinstalled at same location, a check of and/or blade phasing is required.

(2). Support blade parallel to ground.

(3). Remove damper.

NOTE: If damper is to be reinstalled at same location, do not disturb damper clevis, jam nuts or turnbuckle setting. Otherwise, blade phasing is required at reinstallation of damper.

(4). If damper is not to be reinstalled, remove bushing from damper ear and retain with hub.

B. Main Rotor Damper Installation

(1). Check, and if necessary, preset main rotor damper length (Ref. Nominal Damper Adjustment Procedure). Leave jamnuts fingertight.

NOTE: Ensure that bushing is installed in large hole of damper ears.

MAIN ROTOR HUB

REMOVAL/INSTALLATION

1. Main Rotor Hub – General

(Ref. Figure 402) The main rotor hub consists of a central hub, six identical pitch housings spaced 60 degrees apart horizontally around the hub with associated mechanisms and linkages. Lead-lag links, a lead-lag damper, a droop stop striker strip and spacer, and a pitch control bearing with each pitch housing produce the pivoting axis, blade flapping stop contact surfaces and lead-lag hinge function for the rotor blades. Six laminated retention strap assemblies that are flexible both vertically and torsionally extend through the pitch housings and connect to the lead-lag links. A lower shoe, attached to the central hub, contains a droop stop ring and droop restrainers that support the blades at rest and distribute droop loads at low blade rpm. The following instructions provide field maintenance and repair procedures for the main rotor hub.

2. Main Rotor Hub Replacement

A. Main Rotor Hub Removal

(Ref. Figure 401)

Special Tools (Ref. Section 91–00–00)

Item	Nomenclature
ST201	Hoisting adapter
ST701	Main rotor wrench assembly
ST702	Hub puller

(1). Remove main rotor blades.

(2). Remove main rotor drive shaft; then reinstall hoisting eyebolts, washers and nuts in rotor hub. Locate them to correspond with lugs of hoisting adapter (ST201).

(3). Remove lockwire and disconnect flexible boot from lower end of hub liner.

(4). Disconnect each pitch control rod from pitch housing.

(5). Disconnect scissors crank from main rotor hub or scissors link.

NOTE: To facilitate assembly, color code each pitch control rod to match pitch housing to which it is attached.

(6). Remove two screws securing retainer to main rotor hub nut.

(7). Remove nut retainer.

(8). Using main rotor mast nut wrench (ST701), remove nut from mast.

(9). Using hub puller (ST702), break loose main rotor hub. Remove hub puller.

(10). Attach hoisting adapter (ST201), to eyebolts and hoist hub from mast.

B. Main Rotor Hub Installation

(Ref. Figure 402)

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM111	Grease, aircraft
CM115	Grease, oscillating bearing
CM204	Compound, corrosion preventative
CM702	Lockwire CRES

Special Tools (Ref. Section 91–00–00)

Item	Nomenclature
ST201	Hoisting adapter
ST701	Main rotor wrench assembly
ST703	Main rotor hub driver

CAUTION Main rotor hub is a highly stressed component. Use extreme care to prevent it from striking any object. Any impact damage may require replacement of hub.

NOTE:

- Removal of recessed spacer, upper bearing cone, upper seal and seal retainer is not mandatory for installation of the main rotor hub. If these items are installed, perform steps (1). thru (4). and (11). thru (22). Caution should be used when installing hub to prevent damage to these parts.
- If recessed spacer, upper bearing cone, upper seal and seal retainer have been removed, these parts should not be assembled in hub before installation of hub on helicopter. These items are reassembled in hub after seating hub on mast. Prior to installing main rotor hub, insure that all bearings are adequately serviced with grease (CM111).
- Replacement main rotor hubs do not come balanced from MDHS. If installing a replacement hub, perform a main rotor system balance (Ref. Sec. 18-10-60, Main Rotor System Balance Procedure).

(1). Attach hoisting adapter (ST201) to eyebolts in main rotor hub and connect suitable hoist.

CAUTION If hub assembly (with sleeve bushing, spacer, upper bearing and seal retainer installed) does not seat properly onto mast, do not attempt to force it into position. Remove hub assembly from mast and determine cause of hub not seating, correct the problem and follow the procedures for reinstallation.

(2). Check that rotor mast is clean. Hoist main rotor hub and position over mast; then lower hub onto mast.

NOTE: To inhibit mast corrosion when operating in salt water environment, lightly coat bearing journals of mast with grease (CM115).

(3). Remove adapter, hoist and eyebolts.

(4). Check that hub is fully seated on mast.

(5). Hand-pack hub cavity, between sleeve bushing and hub, with grease (CM111).

(6). Place recessed spacer, recess down, on top of sleeve bushing.

(7). Hand-pack upper bearing cup and cone with grease; then install cone on mast and use hub driver (ST703), to fully seat cone.

(8). Fill remaining cavity to upper seal with grease.

(9). Position upper seal in seal retainer with lip up; then press seal and retainer in hub counterbore.

(10). Using a soft drift, carefully tap seal outer ring to seat in counterbore. Wipe away any excess grease.

(11). Apply grease (CM111) to exposed threads on mast.

CAUTION Ensure that seal is properly positioned against seal retainer and that seal retainer does not pinch seal. Check by inserting a loop of approximately 0.050 inch (1.27 mm) diameter lockwire, round feeler gage or other suitable tool without sharp edges between seal lip and retainer.

NOTE: To insure that hub is seated onto mast properly before torquing, two to four threads should be showing above the mast nut with nut installed finger tight.

(12). Install mast nut, using wrench (ST701); torque nut to **200 foot-pounds (271 Nm)**. Apply coat of corrosion preventive compound (CM204) to screw holes in mast nut.

(13). Place retainer on nut and check retainer-to-nut screw hole alignment.

(14). Increase nut torque to not more than **250 foot-pounds (339 Nm)** to align holes in retainer and nut.

NOTE: If holes cannot be aligned in **200 - 250 foot-pound (271 - 339 Nm)** torque range, remove and invert nut and repeat procedures in (12). thru (14). to align holes.

(15). Secure retainer to nut with two screws; safety screws with lockwire (CM702).

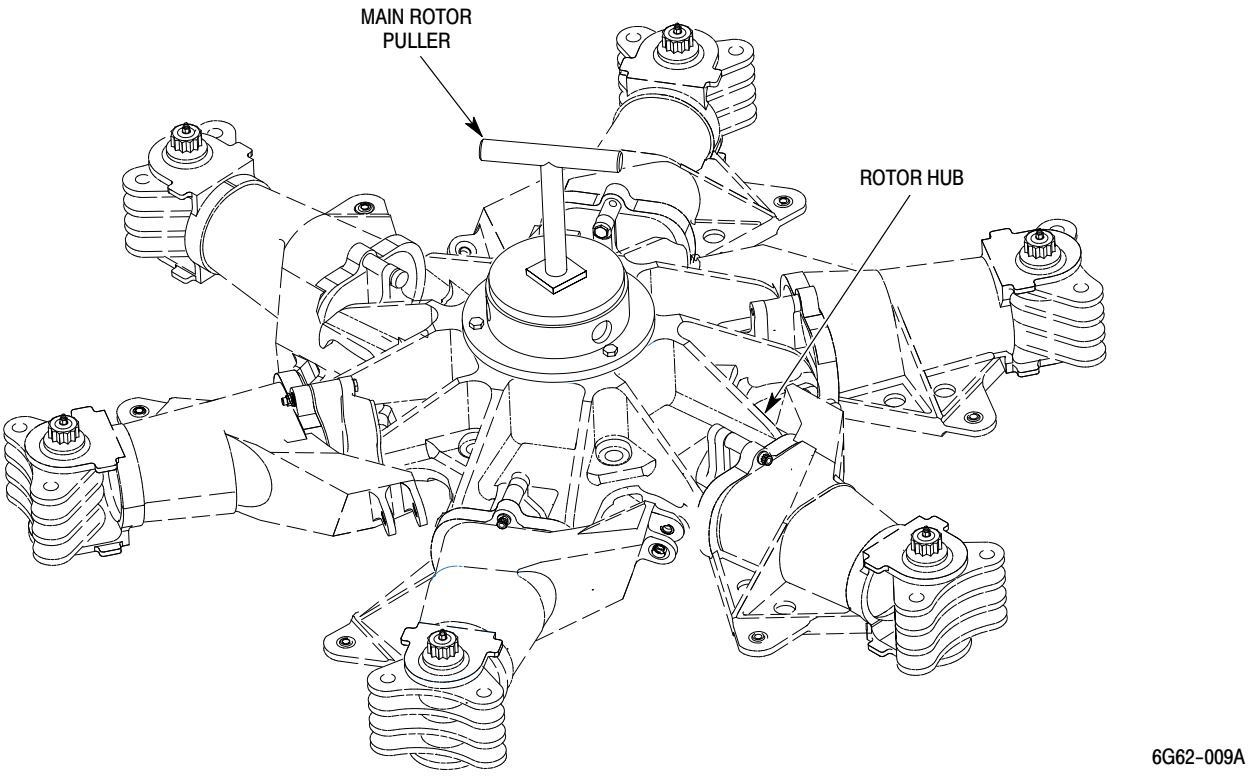


Figure 401. Pulling Hub Assembly

CAUTION Ensure that no washers are used under screw heads and that screw heads are free of burrs.

(16). Verify that screwheads do not project more than 0.020 inch (0.508 mm) above hub upper surface, for adequate clearance between screw heads and driveshaft flange.

(17). Connect scissors crank to main rotor hub lower shoe and/or to scissors link.

NOTE: Ensure pitch control rods are installed at same locations from which removed.

(18). Install pitch control rods to pitch housings (Ref. Sec. 62-30-60, Pitch Control Rod Replacement).

(19). Connect flexible boot to lower end of rotor hub liner and secure with lockwire (CM702).

(20). Install main rotor drive shaft (Ref. Sec. 63-10-00).

(21). Install main rotor blades.

(22). Perform main rotor blade droop angle check if hub is new or replacement.

(23). Perform main rotor system balance (Ref. Sec. 18-10-60, Main Rotor System Balance Procedure) if a new or rebuilt hub is installed.

3. Main Rotor Damper

(Ref. Figure 603) A main rotor damper is attached to each pitch housing of the rotor hub. The damper is connected to the inboard trailing edge of the associated main rotor blade by an adjustable clevis to prevent lateral vibrations from occurring in main rotor blades. Neither damper travel nor stiffness is adjustable on the helicopter. Phasing of rotor blades is affected by turnbuckle adjustment. Any phasing problem caused by a defective damper should be corrected by replacing damper.

CAUTION Excessive lead-lag load applied to the main rotor blades during ground handling can result in damage to the elastomeric damper buns and failure of the damper assembly. Operators and maintenance personnel should use extra caution to avoid lead-lag loads in excess of **35 pounds (155.68 N)** at the tip of the main rotor blades.

NOTE: If one or more main rotor blades strike an object while rotating or the drive system has been subjected to sudden stop, inspect damper.

4. Main Rotor Damper Replacement

A. Main Rotor Damper Removal

(1). Note and record location from which damper is to be removed from main rotor hub.

NOTE: At reinstallation, if damper is not reinstalled at same location, a check of and/or blade phasing is required.

(2). Support blade parallel to ground.

(3). Remove damper.

NOTE: If damper is to be reinstalled at same location, do not disturb damper clevis, jam nuts or turnbuckle setting. Otherwise, blade phasing is required at reinstallation of damper.

(4). If damper is not to be reinstalled, remove bushing from damper ear and retain with hub.

B. Main Rotor Damper Installation

(1). Check, and if necessary, preset main rotor damper length (Ref. Nominal Damper Adjustment Procedure). Leave jamnuts fingertight.

NOTE: Ensure that bushing is installed in large hole of damper ears.

(2). With damper rotational direction decal facing outboard so it can be read, attach damper ears to pitch housing lug with bolt (head up), washers, and nut. Torque nut to **30 - 60 inch-pounds (3.39 - 6.78 Nm)** and install cotter pin.

(3). Adjust main rotor blade phasing for associated main rotor blade.

(4). After final phasing adjustments, torque jamnuts to **95 - 110 inch-pounds (10.73 - 12.43 Nm)**. Safety jamnuts to turnbuckle with new lockwire. Lockwire must be located out-board, away from pitch housing.

NOTE: Threaded end of damper turnbuckle shaft must protrude through clevis base a minimum of two full threads and must clear blade damper attach fitting.

(5). Connect damper to blade.

(6). Remove blade support.

5. Main Rotor Damper Nominal Adjustment

(1). Remove main rotor blade dampers from helicopter if installed.

(2). Store all dampers together in horizontal position for minimum of six hours. Preferred ambient temperature during storage is 55° to 85°F (13° to 30°C).

(3). Set damper length, centerline-to-centerline of bolt attach holes, for initial installation.
600N
8.132 ±0.005 inch (206.553 ±0.127 mm.

(4). Install dampers on helicopter.

SWASHPLATE AND MIXER REMOVAL/INSTALLATION

1. Main Rotor Swashplate

(Ref. Figure 403) The main rotor swashplate includes a rotating swashplate, stationary swashplate, bearing and retainer and two counterweights.

2. Swashplate Replacement

A. Swashplate Removal

(1). Tag or color-identify five pitch control rods (Ref. Figure 401) to simplify replacement at same locations.

CAUTION Failure to reinstall pitch control rods at correct locations probably will result in main rotor blades excessively out of track.

(2). Disconnect pitch control rods from rotating swashplate.

(3). Remove scissors.

(4). Remove main rotor hub.

(5). Disconnect longitudinal link (Ref. Figure 402) from stationary swashplate.

(6). Disconnect right and left side mixer links (Ref. Figure 402) from stationary swashplate.

(7). Remove protective boot from groove in lower side of stationary swashplate (Ref. Figure 403).

CAUTION Do not strike rotating swashplate or bearing assembly (Ref. Figure 403) with tools or in any way deface these components. Rotating swashplate is a stressed part; all surfaces are shot peened. Use particular care to protect teflon liner in bearing bore. A damaged swashplate bearing must not be retained in service.

(8). Lift swashplate carefully up and off of mast.

(9). To remove boot from mast, remove self-clinching nylon strap.

B. Swashplate Installation

(1). If swashplate lower boot was removed, install boot on mast (Ref. Figure 403).

(2). Position swashplate over main rotor mast and carefully lower into place.

(3). Engage upper end of boot in groove at lower side of stationary swashplate. Secure boot with self-clinching nylon strap (Ref. Figure 403).

(4). Align longitudinal link with stationary swashplate (Ref. Figure 402).

(5). Install flanged bushing, if removed, bolt, two washers, nut and cotter pin to secure upper end of longitudinal link.

(6). Align upper ends of mixer links with stationary swashplate. Install slotted bushing (if removed), bolt, two washers, nut and cotter pin to secure each link to swashplate.

(7). Install scissors.

(8). Using color code, reinstall pitch control rods at same locations from which removed.

(9). Check track of main rotor blades (Ref. Chap. 18) following any maintenance activity that could result in a dimensional variation affecting rigging or tracking.

3. Mixer Controls

Mixer controls consist of various links, bellcranks, idlers, support bracket and associated fasteners that secure these components in place and to the control rods and main rotor swashplate.

4. Mixer Controls Replacement

A. Mixer Controls Removal

(Ref. Figure 402)

(1). Remove air intake forward fairing for access.

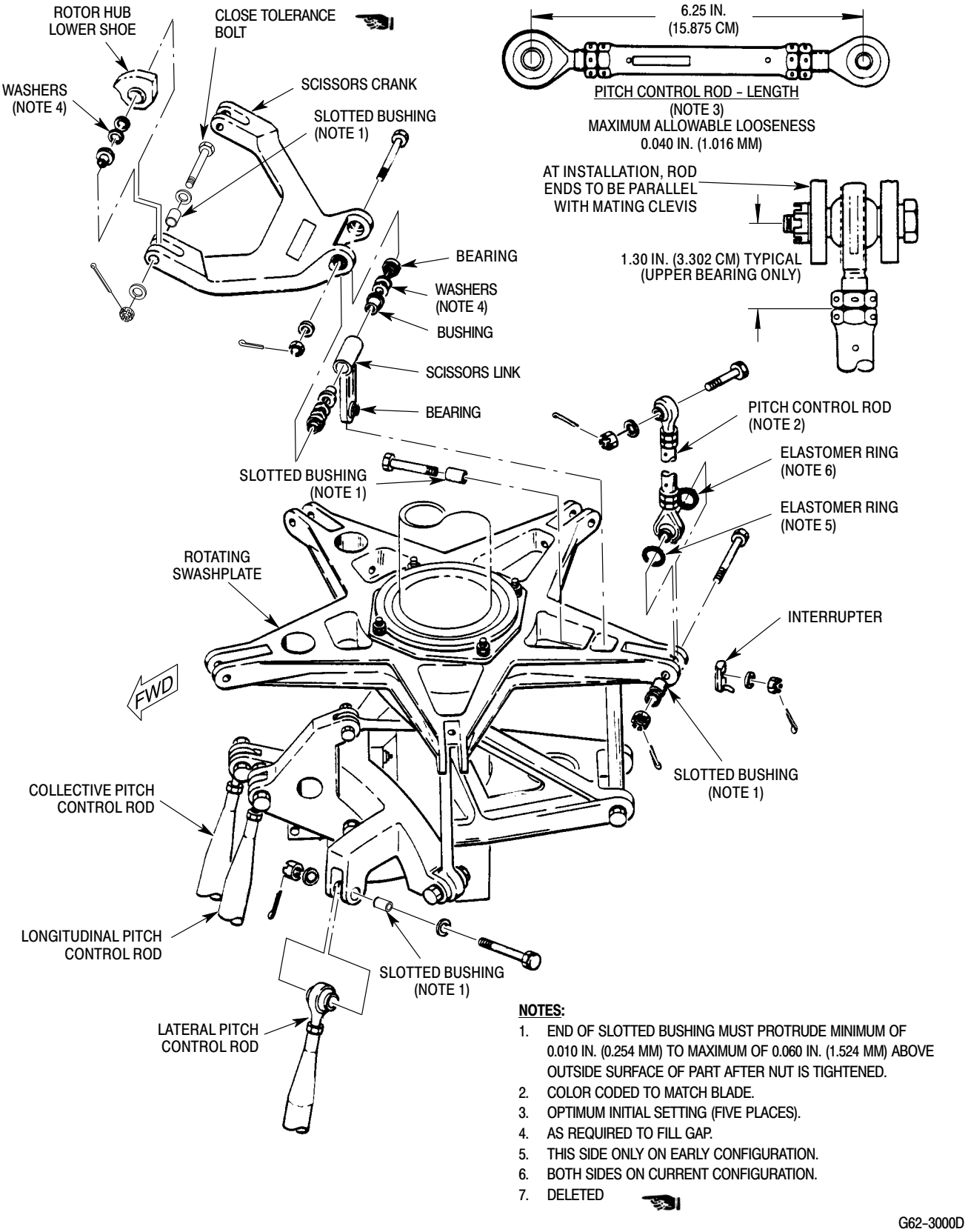


Figure 401. Pitch Control Rods and Swashplate Scissors – Installation

(14). Position mixer links in stationary swashplate and lateral bellcrank; check that slotted bushings are in place. Install attaching hardware.

(15). Place collective mixer, lateral mixer longitudinal mixer control rods (Ref. Figure 401) in mounting position; check that slotted bushing in place. Install attaching hardware.

(16). Install air intake forward fairing.

(17). Check rigging of collective and cyclic controls.

5. Scissors

The scissors provide a movable connection between the rotating swashplate and main rotor hub.

6. Scissors Replacement

A. Scissors Removal

(Ref. Figure 401)

CAUTION Removal of all pitch control rods is recommended prior to scissors removal. Failure to observe this precaution could result in damage to pitch control rods, swashplate and/or hub.

(1). Disconnect lower end of pitch control rod that is in line with scissors link in rotating swashplate.

(2). Remove cotter pin, nut, washer, and bolt from each leg of scissors crank. Disconnect crank from hub lower shoe.

(3). Remove cotter pin, nut, washer, and bolt connecting scissors link to swashplate; remove scissors.

B. Scissors Installation

(Ref. Figure 401)

(1). Place scissors link in mounting position, chamfered edge of link must face outboard.

(2). Check that slotted bushing is in swashplate web and install attaching hardware. Torque nut to **15 - 20 inch-pounds (1.69 - 2.26 Nm)**.

CAUTION Scissors crank must be positioned (Ref. Figure 401) with decal up and proper direction towards lower side lugs.

NOTE: Ensure crank-to-hub lower shoe lugs are not preloaded.

(3). Position scissors crank on hub lower shoe lugs; install connecting hardware (Ref. Figure 401). Torque nuts to **30 - 60 inch-pounds (3.39 - 6.78 Nm);** install cotter pin.

NOTE: Shim washers may be required on shouldered bushing side of clevis.

(4). Position elastomer rings and lower end of pitch control rod in swashplate lug and install attaching hardware. (Nut is to be adjacent to bushing in swashplate.) Torque nut to **30 - 60 inch-pounds (3.39 - 6.78 Nm)**.

7. Scissors Link Replacement

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM103	Solid film lubricant

(1). Remove cotter pin, nut, washer and bolt that join link and crank.

(2). Remove two bushings from link only if replacement is necessary.

(3). Do not remove bearing from link, replace complete link if bearing is defective.

NOTE: Install new bushings using solid film lubricant (CM103); **do not use zinc chromate.**

(4). If bushings were removed at disassembly, install new bushings. After installation, dimension between outer faces of bushings should be 1.579–1.586 inches (4.0107–4.0284 cm).

(5). Align bore of link with bore of crank; install bolt, washer and nut. Torque nut to **30 - 40 inch-pounds (3.39 - 4.52 Nm),** install cotter pin.

8. Pitch Control Rods

Five pitch control rods transfer pitch control from the rotating swashplate to the main rotor blades.

9. Pitch Control Rod Replacement

A. Pitch Control Rod Removal

(Ref. Figure 401)

NOTE:

- If rod is not to be reinstalled, but is to be replaced, measure and record length of removed rod. Optimum length may have been changed at previous rigging; pre-adjust replacement rod to length of rod removed.
- Rods are color coded for reinstallation at correct locations. If more than one rod is being removed and color coding is not visible, identify each by color or similar means to points of connection to simplify reinstallation.

(1). Remove cotter pin, nut, washer and bolt from each end of pitch control rod.

(2). Remove pitch control rod and O-ring.

B. Pitch Control Rod Installation

(Ref. Figure 401)

CAUTION At installation, install rod at correct color code location. Center bearing rodends between attach clevis. If rod length is changed, blades must be tracked.

(1). If actual rod length is incorrect or either actual or required rod length is unknown, preset rod length to optimum length of 6.25 inches (15.875 cm).

NOTE: Install both pitch change rod bolts in direction of rotation.

(2). Install rod with elastomeric rings on both sides of lower bearing.

NOTE: Add washers as required to align nut with cotter pin hole.

(3). Torque upper nut to **100 - 130 inch-pounds (11.30 - 14.69 Nm).**

NOTE: Bushing must project 0.010-0.060 inch (0.254-1.524 mm) after nut is torqued.

(4). Torque lower nut to **30 - 60 inch-pounds (3.39 - 6.78 Nm)**.

(5). Secure nuts with cotter pins.

(6). Rotate pitch change rod assembly fore and aft to ensure clearance exists between rod end bearing and pitch housing clevis at both ends.

(7). If installation is final and tracking is not required, safetywire rod ends to rod; ensure rod ends are centered.

(8). As necessary, repeat above procedures for remaining pitch control rods.

10. Counterweight and Interrupter Installation

Consumable Materials
(Ref. Section 91–00–00)

Item	Nomenclature
CM111	Grease, aircraft
CM409	Adhesive, epoxy

NOTE: If counterweights are to be added, one thick and one thin (any position) is recommended for ease of balancing; Hub must be re-balanced.

(1). Apply coat of adhesive (CM409) to counterweight OD. Reinstall weight with smaller hole outboard, using dummy bolt to align weight to rotating swashplate. Remove bolt and allow adhesive to cure according to container instructions.

NOTE: Ensure interrupters are installed with same type and number of washers removed at disassembly, and that correct part number interrupter is installed in each swashplate arm. (Ref. CSP-IPC-4 for correct part numbers and corresponding locations).

(2). Install interrupters, beveled edges inboard, with bolts, washers, nuts and new cotter pins. Coat bolts with grease (CM111) prior to installation. Torque nuts to **30 - 60 inch-pounds (3.39 - 6.79 Nm)**.

(3). Install interrupters using bolts, washers and nuts; torque nuts to **15 - 20 inch-pounds (1.69 - 2.26 Nm)**.

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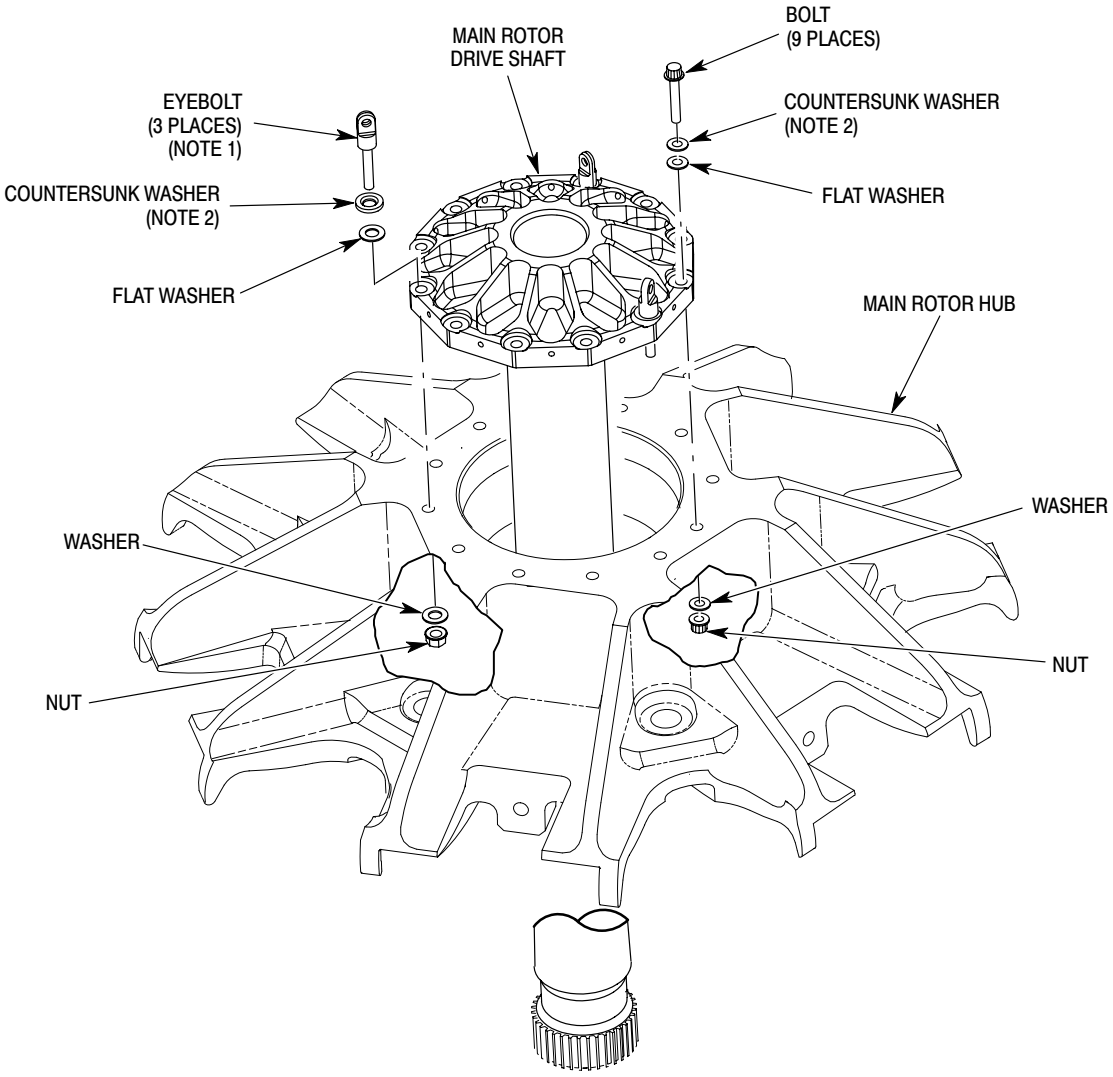


600N INSTALLATION

NOTES:
1. ALIGN HOLES IN EYE BOLTS TO MATCH HOISTING ADAPTER.
2. COUNTERSINK IN WASHER TO FACE BOLT HEAD.

6G63-008

Figure 401. Main Rotor Drive Shaft Installation (Sheet 2 of 2)

3. Main Transmission Drive Shaft

The main transmission drive shaft is equipped with a flexible diaphragm-type joint and mounting flange (coupling) at each end. The shaft connects the overrunning clutch and the transmission input shaft.

4. Main Transmission Drive Shaft Replacement

(Ref. Figure 402)

A. Main Transmission Drive Shaft Removal (Bendix and Kamatic)

(1). Remove sound insulation and main transmission access cover over main transmission drive shaft in cargo compartment.

(2). Remove eight bolts and washers that secure shaft to couplings.

(3). Remove drive shaft; use care to keep it from striking any object.

NOTE: Clutch oil level should be checked any time engine or main drive shaft is removed (Ref. Sec. 12-00-00).

B. Main Transmission Drive Shaft Installation (Bendix and Kamatic)

Consumable Materials (Ref. Section 91–00–00)	
Item	Nomenclature
CM111	Grease, aircraft
CM112	Anti-seize compound high temperature

(1). Check overrunning clutch for correct oil level, indications of oil seepage, drive shaft couplings for corrosion and that coupling bolt securing clutch coupling is torqued to:

(a). For 369A5350 clutch, **actual drag torque plus 250 - 300 inch-pounds (28.25 - 33.90 Nm)**. If bolt is not seated and/or existing torque is found to be less than **250 - 300 inch-pounds (28.25 - 33.90 Nm)**, ensure self-locking drag torque is not less than **25 inch-pounds (2.82 Nm)** before torquing bolt.

(b). For 36F5450 clutch, **actual drag torque plus 315 - 365 inch-pounds (35.59 - 41.24 Nm)**. If bolt is not seated and/or existing torque is found to be less than **315 - 365 inch-pounds (35.59 - 41.24 Nm)**, ensure self-locking drag torque is not less than **25 inch-pounds (2.82 Nm)** before torquing bolt.

CAUTION Compression of drive shaft diaphragms (static state) is limited to 0.020 inch (0.508 mm). Do not stress diaphragms by forcing drive shaft into position for installation in step (2). below.

NOTE: If original shaft and couplings are being reinstalled, a check of shimming as described below is not necessary. Install drive shaft to clutch and transmission couplings as described in steps (1). above and (4). below.

(2). Position drive shaft alongside transmission input and clutch couplings. If compression is required to fit shaft between couplings, continue with step (3). below. If there is a gap between drive shaft flanges and coupling flanges, continue with step (6). below.

NOTE: Removal or addition of shims should be accomplished at transmission input coupling only. Shims at overrunning clutch coupling are of predetermined thickness to prevent O-ring damage and oil leakage.

(3). Remove coupling bolt that secures transmission input coupling; remove coupling and shims.

CAUTION

- The 0.010 inch (0.254 mm) minimum measurement between the bolt seating surface and the input shaft must be obtained to ensure proper clamp up. Warped shims or foreign material could provide a false 0.010 inch (0.254 mm) minimum measurement and improper clamp up could result during normal operation which may damage the main transmission input shaft.

NOTAR® ANTI–TORQUE SYSTEM DRIVE SHAFTS MAINTENANCE PRACTICES

1. Anti–Torque System Drive Shafts

The Fan Gearbox Drive Shaft connects the main transmission and the fan gearbox. The total drive shaft length is approximately 14 inches long. Flanges on each end of the shaft attach to flexible (Kamatic) type joint coupling on the main transmission output shaft and fan gearbox input shaft.

The Fan Inter–Connecting Drive Shaft is equipped with a kamatic flexible–type joint and mounting flange (coupling) at each end. The shaft connects the fan gearbox to the fan assembly by (two) couplings mounted on the output shaft of the fan gearbox and input shaft of the fan assembly. The fan pitch control rod is routed through the center of the inter–connect drive shaft.

2. Fan Gearbox Drive Shaft Replacement

A. Fan Gearbox Drive Shaft Removal

(Ref. Figure 201)

(1). Remove fan gearbox drive shaft access doors and covers, upper aft section fuselage and interior trim panels as required.

(2). Remove tailboom fairing and tailboom (Ref. Sec. 53–40–30).

(3). Remove fan pitch control rod (Ref. Sec. 67–20–30).

(4). Remove fan inter–connecting drive shaft (Ref. Fan Inter–Connect Drive Shaft Replacement).

WARNING

- **To prevent damage to the engine install F.O.D. cover over engine air inlet.**
- **To prevent damage to shaft provide level support for fan transmission drive shaft during removal or installation.**

(5). Gain access thru plenum chamber and remove drive shaft access panel to aft coupling and remove three bolts and washers that secure fan gearbox drive shaft to input shaft coupling on fan transmission gearbox. Support drive shaft and output shaft coupling on main transmission.

(6). Remove fan gearbox (Ref. Sec. 63–25–30).

(7). Remove fan gearbox drive shaft by removing three bolts and washers from output shaft couping on main transmission.

B. Fan Gearbox Drive Shaft Installation

(Ref. Figure 201) Whenever main transmission, fan gearbox, transmission couplings, coupling shims, fan gearbox drive shaft assembly have been replaced, start installation with step (1). below. If none of these components have been replaced, and only installation is involved, start with step (3). below.

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM111	Grease, aircraft
CM112	Anti–seize compound high temperature
CM115	Grease, oscillating bearing
CM318	Primer

NOTE: Kamatic couplings do not require fail-safe bolts or sockets. When installing 369D25501–9 Kamatic coupling, install SKCP2554–15 coupling bolt supplied with the Kamatic coupling or 369D25503–1 bolt. If fan gearbox drive shaft is replaced for torsional buckling, replace and discard main transmission output gear shaft coupling, fan gearbox coupling and both coupling bolts.

(1). Coat coupling splines with grease (CM111) and coupling bolt threads with anti–seize compound (CM112) before assembly. Install coupling onto fan gearbox input shaft and torque coupling bolt to **250 - 300 inch-pounds (28.25 - 33.90 Nm) plus drag torque**. Check

coupling bolt for drag torque serviceability of 25 inch-pounds (2.82 Nm) minimum, 200 inch-pounds (22.60 Nm) maximum.

(2). Coat forward coupling splines with grease (CM111) and coupling bolt threads with anti-seize compound (CM112) before assembly. Install coupling onto main transmission output shaft and torque coupling bolt to **250 - 300 inch-pounds (28.25 - 33.90 Nm) plus drag torque**. Check coupling bolt for drag torque serviceability of 25 inch-pounds (2.82 Nm) minimum, 200 inch-pounds (22.60 Nm) maximum.

(3). Support drive shaft and position to align with fan transmission coupling on main transmission.

(4). Install fan gearbox with four mounting bolts and torque to **70 - 90 inch pounds (7.90 - 10.17 Nm)**; torque-stripe bolts.

NOTE: If re-shimming is required, removal and installation of the fan gearbox is necessary to obtain the specified gap between the coupling flange and flange of drive shaft.

(5). Install three bolts and washers to connect fan gearbox coupling to drive shaft; torque bolts to **80 - 100 inch-pounds (9.04 - 11.30 Nm) plus drag torque**.

(6). Align forward end of drive shaft with coupling on main transmission output gearshaft. Partially install three bolts as an alignment aid but do not tighten.

(7). Obtain 0.010-0.020 inch (0.254-0.508 mm) gap between forward flange of the fan gearbox drive shaft and flange of forward coupling using the following procedure:

(a). Ensure alignment bolts in previous step are backed off between 0.050-0.100 inch (1.270-2.540 mm).

(b). Push and hold fan output pinion shaft of main rotor transmission forward (into transmission) to remove end play. If rotor brake is installed, ensure that brake pucks do not restrict axial travel of fan output shaft.

(c). Remove end play in fan transmission by applying force to the coupling in opposite direction of operation while still holding forward coupling of drive shaft on main transmission. Do not push fan drive shaft fwd or aft.

(d). Using feeler gage, measure gap between forward coupling flange and flange of fan drive shaft using average of 3 readings. Record the gap.

(e). Adjust the number of shims (369A5516-3, -5, -7, or -9). Using measured gap from step 4 above, add or remove required number of shims behind the coupling of main transmission output pinion shaft or between fan gearbox forward coupling to obtain specified gap of 0.010-0.020 inch (0.254-0.508 mm).

NOTE: All shims may be removed from forward or aft coupling if required.

(f). Coat forward coupling splines with grease (CM111) and coupling bolt threads with anti-seize compound (CM112) before assembly. Install coupling and torque coupling bolt to **250 - 300 inch-pounds (28.25 - 33.90 Nm) plus drag torque.** Check coupling bolt for drag torque serviceability of 25 inch-pounds (2.82 Nm) minimum, 200 inch-pounds (22.60 Nm) maximum.

(8). Install three bolts and washers at forward coupling; torque bolts to **80 - 100 inch-pounds (9.04 - 11.30 Nm) plus drag torque**.

(9). Slowly rotate drive shaft and check for not less than 0.25 inch (6.35 mm) clearance between shaft and fairing tube at Sta. 137.50. In addition, check for minimum clearance of 0.190 inch (4.83 mm) between shaft and cooling blower scroll.

B. Main Transmission Installation

(Ref. Figure 201)

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM111	Grease, aircraft
CM112	Anti-seize compound high temperature
CM121	Preservation oil
CM125	Oil
CM126	Oil, turbine
CM234	Solvent, dry-cleaning
CM417	Cement
CM425	Sealing compound
CM430	Sealant, solvent resistant

(1). Perform the following steps as applicable to build up main transmission prior to installation.

(a). Install one preliminary 0.010 inch (0.250 mm) shim on tail rotor output shaft to prevent coupling bolt from bottoming in shaft.

(b). Coat coupling splines with grease (CM111) and coat bolt threads with anti-seize compound (CM112) before assembly. Install shaft coupling and temporarily tighten coupling bolt to approximately **250 inch-pounds (28.25 Nm)**.

(c). Install tachometer generator. With rotor brake installed, ensure electrical receptacle is at 11 o'clock position.

(d). Install input shaft seal drain connector, bonding it in place with sealing compound (CM425).

(e). Bond main rotor output shaft O-ring in place with cement (CM417).

(f). Bond filler seal to transmission with cement (CM417).

(g). If filler is safetied to case bolt, cut a small section from seal and bond in place. After bonding, fill gap in seal with sealant (CM430).

(2). Use clean, absorbent cloth to clean pan beneath main rotor mast support, especially area contacted by O-ring on top of transmission.

CAUTION Damage to main rotor drive shaft or main transmission splines can occur during installation. Care should be taken while meshing drive shaft splines into transmission output splines to prevent damage.

(3). With assistance, slowly and evenly lift and position transmission in place on mounting studs.

(4). Install four washers and nuts; torque to **60 - 80 inch-pounds (6.78 - 9.04 Nm)**.

(5). If transmission is new, drain any residual preservative oil. Service transmission with lubricating oil (CM125 or CM126) (Ref. Sec. 12-00-00).

(6). Connect wiring to tachometer generator, two chip detectors and oil pressure switch.

(7). Install anti-torque drive shaft (Ref. Sec. 63-15-10/30).

CAUTION When reinstalling main rotor drive shaft, check that there is no gap between shaft mounting flange and rotor hub before tightening installation bolts. Gap indicates that shaft splines are not correctly meshed in transmission.

(8). If main rotor drive shaft has been removed, apply coating of lubricating oil (CM121) on shaft before reinstallation and install drive shaft (Ref. Sec. 63-10-00).

(9). Connect tail rotor output shaft seal drain line and input shaft seal drain line and two hoses that attach to lubrication pump.

(10). Install cooling blower (Ref. Sec. 63-21-00).

(11). Coat input drive coupling splines with grease (CM111) and coat bolt threads with anti-seize compound (CM112) before assembly. Install pulley guard, drive pulley, shim, coupling and coupling bolt and temporarily tighten coupling bolt to approximately **250 inch-pounds (28.25 Nm)**.

NOTE: Refer to Sec. 63-10-00, Main Transmission Drive Shaft Installation for coupling shimming, coupling torque and drive shaft installation.

(12). Install main transmission drive shaft (Ref. Sec. 63-10-00).

(13). Ground run helicopter (refer to appropriate PFM) and check drive system for excessive vibration and unusual noise. Verify absence of oil over-temperature and low pressure indications. Inspect for oil leakage.

(14). Install access covers and sound insulation (Ref. Sec. 52-40-00).

3. Main Transmission Inspection Procedure

(Ref. Figure 201) The following procedures provide information for checking the main transmission for oil leakage and mechanical defect.

(1). Remove sound insulation and transmission access covers (Ref. Sec. 52-40-00).

(2). Inspect transmission for oil leaks, cracks, corrosion, secure electrical connections and correct oil level. Evaluate oil leakage according to Fluid Leak Analysis.

CAUTION Inspect all fluid lines for adequate clearance between structure and components. Vibration may cause chafing of lines and subsequent leaking.

(3). Inspect four mounting flanges on main transmission housing for corrosion and cracks. Check that transmission mounting studs and nuts are secure. This should be accomplished from fuselage interior as well as exterior at main rotor mast base.

(4). Check that all safety wiring is intact.

4. Main Transmission Repair Procedure

(Ref. Figure 201) Replace electrical components, breather-filler, filler screen, externally accessible O-rings, lubrication pump, filter, input shaft oil seal and tail rotor output shaft oil seal if defective. Dents in outer surface of transmission housing deeper than 0.10 inch or covering more than 0.60 square inch (3.87 cm^2) area require replacement of transmission (for repairs not covered in this section, Ref. COM). This procedure is applicable to dents not exceeding specified limits.

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM234	Solvent, dry-cleaning
CM318	Primer
CM411	Adhesive, epoxy
CM801	Abrasive paper, silicon carbide

NOTE: Any evidence of lubricating oil leakage in a repair area requires replacement of transmission.

(1). Clean area with solvent (CM234) and remove sharp edges with grade 320 abrasive paper (CM801).

(2). Apply coat of primer (CM318) on repaired surface.

(3). If dent is deeper than 0.030 inch (0.76 mm), fill depression with epoxy adhesive (CM411) and blend to surrounding surfaces.

(4). Touch up re-worked area with paint (Ref. Sec. 20-30).

5. Input Drive Assembly – Oil Leakage Repair Procedure

(Ref. Figure 202) Use the following repair procedure when oil leakage occurs between the main transmission housing and the pinion bearing sleeve flange. Replace the 369D25184-3 O-ring as follows.

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM218	Alcohol, denatured

(1). Remove the shaft interconnect, transmission input coupling, drive pulley and guard, and cooling blower assembly (Ref. Sec. 63-21-00).

(2). Drain oil from input drive assembly through the lower chip detector plug (Ref. Sec. 12-00-00).

(3). Remove attaching hardware securing blower mount assembly (Ref. Sec. 63-21-00).

(4). Install four alignment bolts in place of attaching hardware for blower mount assembly. (Use any type of 2.00 inch (5.08 cm) length x 1/4-28 diameter bolt.)

(5). Install slide hammer tool on input drive assembly pinion.

NOTE:

- It may be necessary to heat main housing to move input drive assembly.
- Any movement of more than 0.150 inch (3.81 mm) may cause disengagement of scavenge pump drive.

(6). Gently tap input drive assembly away from main housing no more than 0.150 inch (3.81 mm) to gain access to O-ring between main housing and input pattern shim.

(7). Remove slide hammer tool from input drive assembly pinion.

(8). If required, cut defective O-ring for removal.

(9). Clean and inspect pattern shim for distortion and ensure no overlap condition exists at butt/split line of shim.

(10). Clean area between main housing and input drive sleeve with alcohol (CM218) to remove paint chips or other foreign matter.

(11). Install new 369D25184-3 O-ring by slipping over blower mount. Seat O-ring in contact with the main housing.

(12). Remove alignment bolts and install assembly aid tool halves between O-ring and input bearing sleeve flange. (Refer to Figure 203 for locally fabricated assembly aid tool.)

(13). Install attaching hardware in blower mount, input pinion bearing sleeve, and assembly aid tool.

(14). Tighten attaching hardware as follows:

(a). Maintain an inward preload of the assembly aid tool halves against the input pinion bearing sleeve while tightening the four attaching bolts equally.

(b). Tighten hardware until attaining a positive clamp-up between the main housing, assembly aid tool halves, and input pinion bearing sleeve flange.

(15). Remove attaching hardware and slide out the assembly aid tool halves.

(16). Ensure the O-ring is seated in main housing groove.

(17). When O-ring is seated correctly, reinstall input pattern shim between main housing and input pinion bearing sleeve flange and reinstall hardware.

(18). Tighten attaching hardware as follows:

(a). Maintain an inward preload on input pattern shim during the tightening sequence.

(b). Torque attaching hardware **65 - 75 inch-pounds (7.34 - 8.47 Nm)**.

(19). Inspect pattern shim to ensure no overlap condition exists at butt/split line.

(20). Reinstall the shaft interconnect, transmission input coupling, drive pulley and guard, and cooling blower assembly (Ref. Sec. 63-21-00).

(21). Add oil to input drive assembly (Ref. Sec. 12-00-00).

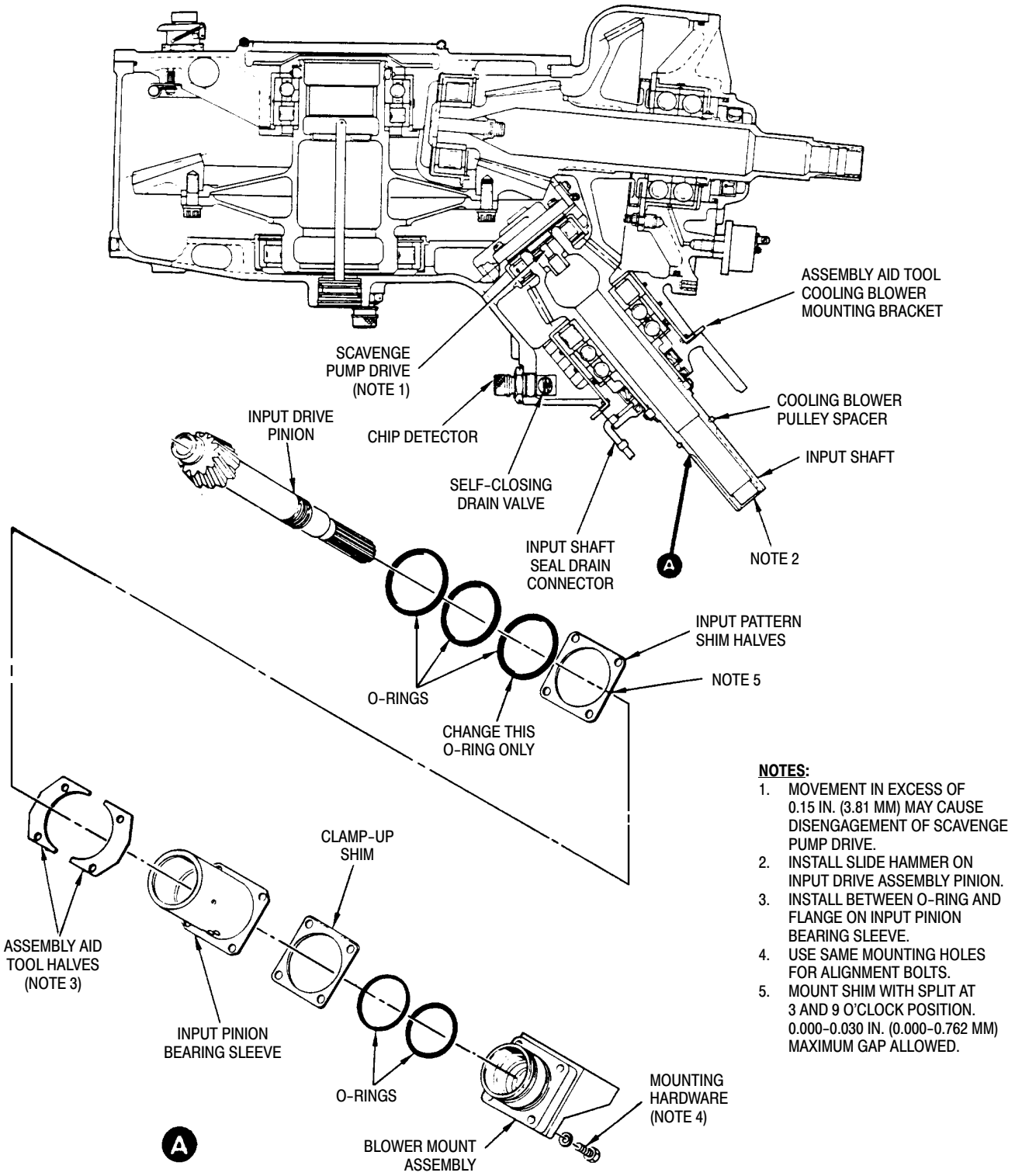


Figure 202. Input Drive Assembly O–Ring Replacement

NOTE: For 369D25100 transmission installation only; If equipped with 369D25626-11 mount bracket, examine bolts securing mount bracket to cooling blower assembly. If safety wired, remove and discard bolts. Replace with NAS1224-1L self-locking bolts.

(6). Disassemble cooling blower if required.

B. Cooling Blower Installation (369D25100 Transmission)

(Ref. Figure 405)

(1). Install pulley guard on main transmission input shaft.

(2). With belt looped around transmission input shaft, position mounting bracket on main transmission pad and loosely install four bolts and washers. Before tightening bolts, insert two shims between bracket and transmission pad. Verify that blower scroll clears tail rotor drive shaft by at least 0.190 inch (4.83 mm). Torque bolts to **65 - 75 inch-pounds (7.34 - 8.47 Nm)**. Lockwire bolt heads after belt tension is checked.

(3). Connect drain tube to cooling blower scroll fitting. Clamp tube to fitting with two turns of lockwire.

(4). Roll exhaust duct rubber connectors onto scroll outlets and secure with tie-down straps (Transmission oil cooler duct and engine oil cooler duct).

CAUTION In the following step do not use levers or other tools on belt, or in any way force belt onto pulley.

(5). Slide pulley onto transmission input shaft to engage belt in teeth of both pulleys.

(6). Adjust belt tension.

NOTE: Instructions in step (7). below, apply only when original shim(s) (same shim thickness) are installed and drive shaft, overrunning clutch and couplings remain unchanged. A distance of 0.010 inch (0.254 mm) between bolt seating surface on coupling and transmission input shaft is required to ensure coupling bolt will not bottom out shaft and to provide proper assembly clamp up. (Ref. Sec. 63-10-00).

CAUTION The 0.010 inch (0.254 mm) minimum measurement between the bolt seating surface and the input shaft must be obtained to ensure proper clamp up. Warped shims or foreign material could provide a false 0.010 inch (0.254 mm) minimum measurement and improper clamp up could result during normal operation which may damage the main transmission input shaft.

(7). Install laminated shim and coupling on transmission input shaft. Secure coupling with coupling bolt; torque to **250 - 300 inch-pounds (28.25 - 33.90 Nm) plus drag torque**.

(8). Install main transmission drive shaft (Ref. Sec. 63-10-00).

(9). Install access panels.

14. Oil Cooler Blower Installation (369F5100 Transmission)

(Ref. Figure 406)

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM111	Grease, aircraft
CM112	Anti-seize compound high temperature
CM425	Sealing compound
CM702	Lockwire CRES

(1). With belt looped around driven pulley, install oil cooler fan bracket.

NOTE: NAS1304 series bolts may be used in place of NAS6604 series bolts.

(a). Install four bolts with washers through oil cooler mounting bracket into fan bracket.

(b). Before tightening bolts, displace cooler toward the transmission flange to eliminate slack in that direction.

(c). Torque bolts to **70 - 90 inch-pounds (7.91 - 10.17 Nm)** and safety with lockwire (CM702).

(d). After bolts are torqued, seal around bolt heads with sealant (CM425).

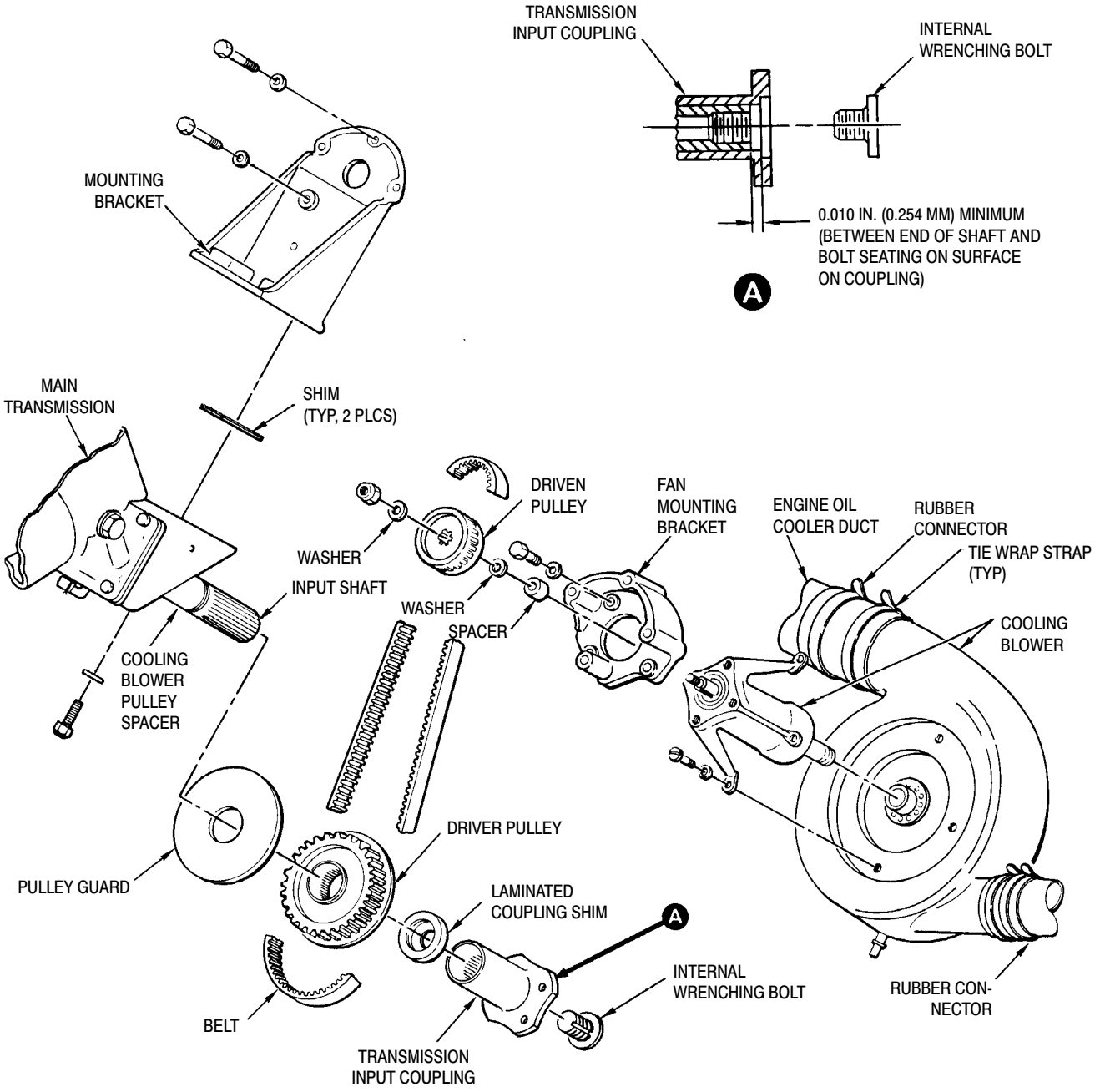


Figure 405. Cooling Blower Installation (369D25100 Transmission)

CAUTION When installing pulley and guard, ensure spring pin in pulley is fully engaged inside hole in pulley guard.

(2). Install pulley guard on main transmission input shaft.

(3). With belt looped around transmission input shaft, position mounting bracket on main transmission pad and loosely install two bolts with washers from the bottom of bracket and two bolts with washers from top of bracket.

(4). Before tightening bolts, insert two shims between bracket and transmission pad.

(5). Verify that blower scroll clears anti–torque drive shaft by a minimum of 0.190 inch (4.826 mm).

CAUTION In the following step, do not use levers or other tools on belt, or in any way force belt onto pulley.

(6). Slide driver pulley onto transmission input shaft to engage belt in teeth of both pulleys.

CAUTION

- The minimum of 0.010 inch (0.254 mm) measurement between the bolt seating surface and the input shaft must be obtained to ensure proper clamp–up. Warped shims or foreign material could provide a false 0.010 inch (0.254 mm) minimum measurement and improper clamp–up could result, which during normal operation, may damage the main transmission input shaft.
- Do not use clutch coupling shims under transmission input coupling. Inside diameter of clutch coupling shim is different than shim used on transmission input coupling. Incorrect diameters can cause an improperly seated shim, misalignment and cocked coupling.

(7). Torque bolts to **70 - 90 inch-pounds (7.91 - 10.17 Nm)**.

(8). Coat threads of coupling bolt with anti–seize compound (CM112).

(9). Lubricate input shaft splines and coupling splines with grease (CM111).

(10). Install input coupling shim and coupling on transmission input shaft with coupling bolt.

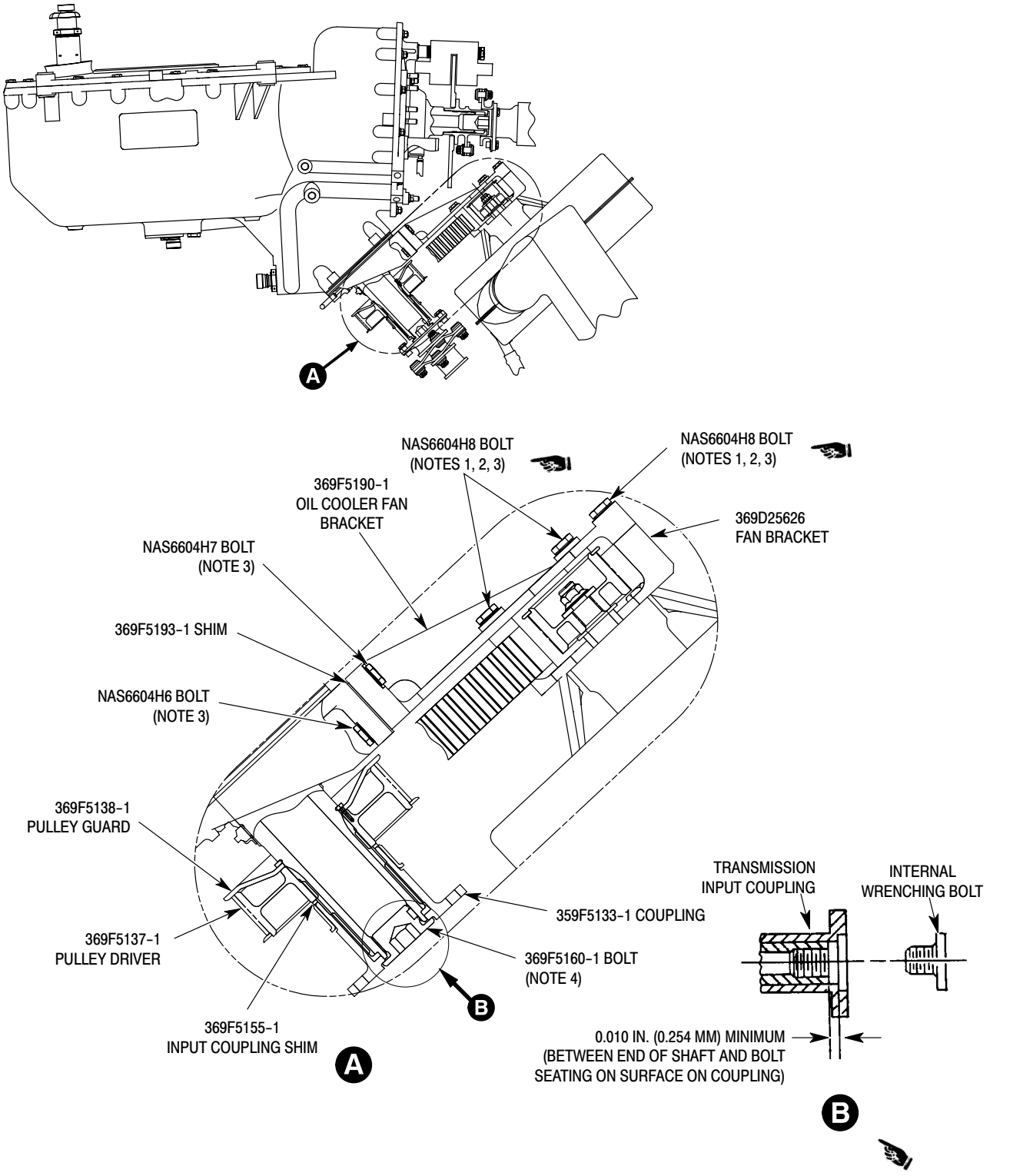
(11). Adjust belt tension (Ref. Sec. 63–21–00, Cooling Blower Belt Tension Check and Adjustment).

NOTE: Check coupling bolt for a minimum of **25 inch-pounds (2.82 Nm)** drag torque.

(12). Torque coupling bolt to **315 - 365 inch-pounds (35.59 - 41.24 Nm) plus drag torque**.

(13). Connect drain tube to cooling blower scroll fitting. Clamp tube to fitting with two turns of lockwire (CM702).

(14). Roll exhaust duct rubber connectors onto scroll outlets (transmission oil cooler duct and engine oil cooler duct) and secure with tie straps.



NOTES:

1. TORQUE BOLTS TO 70 - 90 INCH-POUNDS (7.91 - 10.17 NM).
2. AFTER TORQUING, SEAL BOLT HEADS WITH SEALANT (CM425).
3. TORQUE BOLTS TO 70 - 90 INCH POUNDS (7.91 - 10.17 NM) AND SAFETY WITH LOCKWIRE (CM702).
4. TORQUE COUPLING BOLT TO 315 - 365 INCH POUNDS (25.59 - 41.24 NM) PLUS DRAG TORQUE (DRAG TORQUE TO BE NOT LESS THAN 25 INCH-POUNDS (2.82 NM)).

CSP102-012B

Figure 406. Oil Cooler Blower Installation (369F5100 Transmission)

MAIN TRANSMISSION LUBRICATION AND COOLING SYSTEM

INSPECTION/CHECK

1. Lubrication System Inspection

(Ref. Figure 601)

(1). Inspect plumbing and system components from oil cooler to lubrication pump for leaks, secure attachment and damage.

(2). Inspect oil cooler, lubrication pump, oil filter, oil pressure switch, liquid level plug, and chip detectors for leaks, secure attachment and damage.

(3). Inspect electrical connections at oil temperature switch, oil pressure switch, and chip detectors for absence of corrosion, secure attachment and damage.

2. Cooling Blower Inspection

(Ref. Figure 405)

(1). Remove blower access door and inspect belt for damage or excessive wear. Belt should be fully seated in pulley grooves. Limited cracking or separation of belt.

(a). Belt should be fully seated in pulley grooves.

(b). Limited cracking or separation of belt between pulley grooves is acceptable. Visually monitor any propagation. Belt should be replaced if any one separation exceeds three inches in length or if total separation exceeds 50 percent of peripheral length of belt. (For belt replacement schedule, refer to Section 05-10-00).

(2). Check belt tension.

(3). Hand-rotate main rotor to examine all visible areas of driven pulley and driver pulley for damage or excessive wear. Listen for sounds of defective bearings or of impeller touching scroll while rotor is turned.

(4). Examine scroll for cracks or breaks, and for secure attachment to hub.

(5). Examine rubber connectors at engine oil cooler duct and transmission oil cooler duct where they attach to scroll. Examine ducts for damage.

(6). Look through hub support legs and, to extent possible, inspect impeller for damage. A crack, loose rivet or distorted vane is cause for impeller replacement. Inspect mount screws and bolts for evidence of broken slippage mark paint.

(7). Examine scroll drain tube for damage, secure attachment and clear passage.

(8). Examine mounting bracket and fan mounting bracket for secure attachment. Check for broken lockwire at bolt heads securing mounting bracket cooling blower assembly.

3. Cooling Blower Inspection (Disassembled)

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM206	Chemical coating
CM318	Primer
CM801	Abrasive paper, silicon carbide

(1). Examine belt for damage or excessive wear (Ref. Figure 405).

(2). Examine driver pulley, pulley guard and driven pulley for damage or excessive wear.

(3). Check driven pulley retaining nut for a minimum of **160 inch-pounds (18.08 Nm) plus drag torque**. If loss of torque is indicated, remove pulley nut and inspect washer for evidence of elongation and wear.

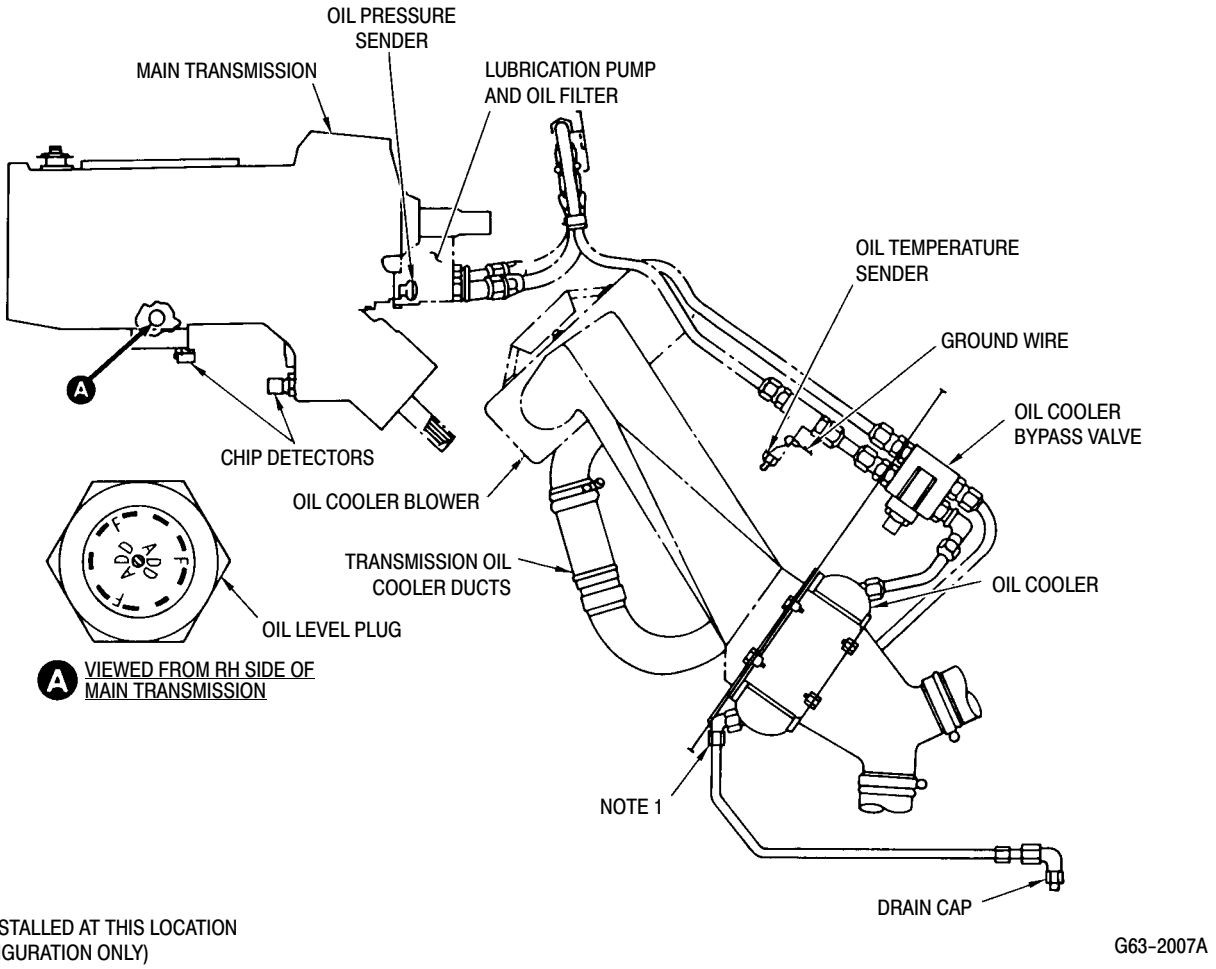


Figure 601. Main Transmission Cooling Blower and Duct

(4). Check pulley shaft and splines for condition. Replace damaged flat washer or ring washer with flat washer. Install and torque nut to **160 - 190 inch-pounds (18.08 - 21.47 Nm) plus drag torque**.

(5). Examine mounting bracket and fan mounting bracket for cracks and breaks.

(6). Examine web of mounting bracket for wear.

(a). Remove nicks, scratches or grooves leaving sharp impressions in web. Minimum acceptable web thickness: 0.125 inch (3.175 mm).

(b). Replace mounting bracket if web does not meet 0.125 inch (3.175 mm) minimum after repair.

(7). Examine scroll (Ref. Figure 801) for cracks, breaks and distortion.

CAUTION Handle impeller carefully to prevent damage that could cause imbalance and require replacement of impeller.

(8). Visually (minimum 10X magnification) examine impeller (Ref. Figure 801) for cracks, deformation and separation.

(a). Look for foreign material attached to impeller. None is permitted.

(b). Check for loose rivets at hub.

(c). Use electroprobe or gage of equivalent accuracy to measure depth of scratches or nicks.

(d). Use penetrating dye to examine suspected cracks.

(e). Scratches and nicks not exceeding 0.006 inch (0.152 mm) depth are repairable by sanding with grade 320 abrasive paper (CM801) to blend defect into surrounding area.

1). Treat blended areas with chemical coating (CM206) and touch-up with primer (CM318).

2). All other defects require replacement of impeller.

(9). Examine shaft for damage or excessive wear. Discard seal (Ref. Figure 801).

4. Cooling Blower Belt Tension Check and Adjustment

(1). Check that laminated shims are in position between mounting bracket and transmission fan mount assembly. Tighten the four mounting bolts. Rotate pulley by hand a few turns to even out belt tension.

(2). Measure belt deflection three times at approximate center of one of the spans. The force required to deflect the belt 0.170-0.200 inch (4.32-5.08 mm) must be 1.75-2.00 pounds (0.7938-0.9072 Kg). This load is to be applied at a right angle to the outside face of the belt. Measure belt deflection without turning driven pulley, then turn driven pulley 1/2 turn and repeat belt deflection measurement. Turn driven pulley an additional 1/4 turn and measure belt deflection again.

(a). If the tension is too high, greater than 2.00 pounds (0.9072 Kg), tension can be reduced by peeling off a layer of the laminated shim, one at a time equally from both shims, until tension falls into proper range.

(b). If the tension is too low: Add layers from a spare shim in the same manner as removed in step (2).(a). above, until tension falls into proper range.

(3). Make a final check of bolt torque, **60 - 75 inch-pounds (6.78 - 8.47 Nm)**, and then lockwire drilled heads.

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2. 369D25630 Cooling Blower Reassembly

(Ref. Figure 801)

Consumable Materials
(Ref. Section 91–00–00)

Item	Nomenclature
CM111	Grease, aircraft
CM219	Methyl-ethyl-ketone
CM220	Naphtha aliphatic
CM222	1,1,1-Trichloroethane
CM321	Surface primer locking compound
CM425	Sealing compound
CM431	Sealing, locking and retaining compound

NOTE: Following procedure covers assembly of completely disassembled cooling blower, together with those items (belt, brackets, etc) that form a complete unit. Use only applicable steps of procedure when disassembly is less than complete. New bearings and new seal are required; those removed are not to be reused.

(1). Install inner retaining ring in hub and if removed at disassembly install new O-ring in upper bearing sleeve.

(2). Lightly grease (CM111) smaller bearing journal of shaft, and bore of corresponding bearing.

NOTE: This bearing does not have a metal shield.

(3). Place bearing on shaft so that rubber seal of bearing faces splined end of shaft.

(4). Using tube that contacts only edge of inner race of bearing, arbor-press bearing onto journal until inner race contacts shaft shoulder.

(5). Clean outer race of both bearings and faying surfaces of both hub sleeves with trichloroethane (CM222) and clean cloth or paper towel.

(6). Arbor-press bearing (with shaft installed) into sleeve. Exert pressure only on bearing outer race and on impeller-end of hub casting (no pressure on impeller-end sleeve).

(7). Lightly grease (CM111) larger bearing journal of shaft and bore of remaining bearing.

CAUTION On current configuration Cooling blowers, apply locking compound (CM431) to outer race of lower bearing (impeller end) only. Do not apply locking compound to upper bearing (pulley end).

(8). Apply primer (CM321) and locking compound (CM431) to faying surfaces of outer bearing race and sleeve according to container instructions. Be careful to prevent compounds from entering bearing.

NOTE: On newer style bearings, the metal shield is replaced by a blue shield.

(9). Insert bearing so that shield side (metal shield or blue disc) faces interior of hub and seal side (rubber disc) faces impeller end of shaft.

(10). Arbor-press bearing simultaneously onto shaft journal and into sleeve. Exert pressure equally on both races of bearing. At same time, exert equal pressure on splined end of shaft and pulley end of hub casting. Bearing is to firmly contact shaft shoulder and inner retaining ring.

WARNING **MEK solvent is flammable. Use only in well-ventilated area and away from heat and flame.**

(11). Wipe away excess locking compound. Use methyl ethyl keytone (CM219) if hardening begins. Leave assembled parts undisturbed to permit locking compound to cure for two hours at 75°-100°F (24°-38°C), or for ten minutes at 220° ±l0°F (105° ±5°C).

(12). Temporarily install lubrication fitting.

(13). Install new seal, spring washer and outer retaining ring.

(14). Fill hub cavity with grease (CM111) through lubrication fitting until grease seeps out around seal of bearing nearest splined end of shaft. After lubrication, remove lubrication fitting and install screw and washer. Lockwire screwhead.

(15). Install hub on scroll with four screws and washers. Torque screws to **12 - 15 inch-pounds (1.36 - 1.69 Nm)**.

(16). Install spacer and impeller on shaft.

(17). Install washer and locknut on end of shaft. Using holding device on splined end of shaft, tighten locknut sufficiently to remove all end clearance from stack-up of parts.

(18). Using feeler gage through an air outlet port, measure minimum clearance between impeller and scroll lip.

NOTE: If minimum clearance is 0.020-0.040 inch (0.508-1.016 mm), steps (19). and (20). below may be bypassed.

(19). If clearance is more than 0.040 inch (1.016 mm), remove impeller and spacer. Replace spacer with 369H5654 shims as required between impeller and seal to obtain 0.020-0.040 inch (0.508-1.016 mm) clearance. Reinstall impeller, washer and locknut. Tighten to remove all end clearance, and then rotate impeller and check for rubbing. If rubbing occurs, perform step (20)., otherwise proceed to step (21)..

(20). If clearance is less than 0.020 inch (0.508 mm), or if rubbing occurs when performing previous step, disassemble and install shim(s) between seal and spacer to ensure 0.020-0.040 inch (0.508-1.016 mm) minimum clearance and prevent rubbing.

(21). When clearance is properly adjusted, remove impeller, install key, impeller, washer and locknut. Torque locknut to **250 - 300 inch-pounds (28.25 - 33.90 Nm)**. Use care to avoid placing stress on impeller or scroll. Hold splined end of shaft in suitable device.

NOTE: Install two self-locking bolts in place of safety-wired bolts if not previously installed.

(22). (Ref. Figure 405) Secure fan mounting bracket on hub with four bolts and washers on early configurations, or two self-locking bolts, two screws and four washers on current versions. Before tightening bolts, fully displace bracket in direction that causes it to be closest to main transmission drive shaft when cooling blower is installed, then torque bolts to **65 - 75 inch-pounds (7.34 - 8.47 Nm)**. Apply slippage mark paint.

(23). (Ref. Figure 405) Install spacer, washer, pulley, washer and nut on shaft. Hold nut on impeller end of shaft with socket wrench and tighten pulley nut to **160 - 190 inch-pounds (18.08 - 21.47 Nm) plus drag torque**.

(24). (Ref. Figure 405) Install belt on pulley and secure mounting bracket to fan mounting bracket with four bolts and washers. Before tightening bolts, fully displace bracket in direction that causes it to be closest to main transmission drive shaft when cooling blower is installed, then torque bolts to **65 - 75 inch-pounds (7.34 - 8.47 Nm)** and lockwire drilled heads.

(25). Clean faying surfaces of scroll and cover with naphtha (CM220); apply sealant (CM425) according to container instructions before securing cover to scroll with eight screws and washers.

3. 600N5630 Cooling Blower Disassembly

(Ref. Figure 802)

NOTE: Disassemble cooling blower only to extent necessary to perform inspection, replacement or repair of specific items. Replace cooling blower bearings and belt per replacement schedule (Ref. Sec. 05-10-00).

(1). Remove mounting bracket (Ref. Sec. 63-20-25).

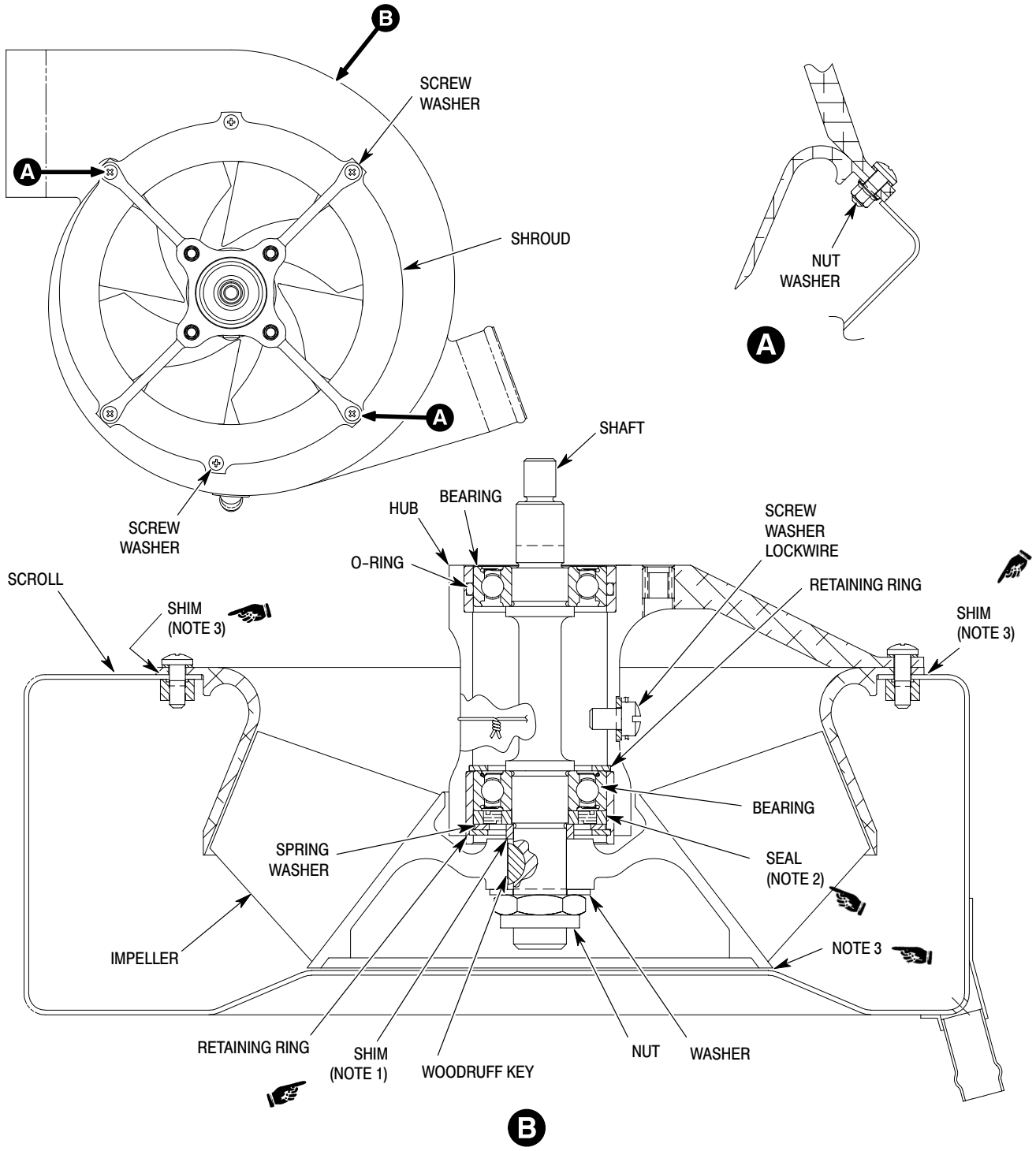
(2). Hold impeller retaining nut with socket wrench and remove driven-pulley retaining nut and washer.

(3). Remove driven pulley. Do not forcefully tap or pry; if necessary, use pulling device.

(4). Remove spacer from impeller shaft.

(5). Remove two screws and washers that attach scroll to shroud.

(6). Remove four screws six washers, and two nuts that attach hub to shroud and scroll. Retain shim if installed.



NOTE:

1. SHIM IMPELLER TO PROVIDE 0.020-0.030 IN. (0.508-0.762 MM) AVERAGE BLADE TRAILING EDGE TIP CLEARANCE-TO-SHROUD, MEASURED PERPENDICULARLY TO THE SHROUD FACE. THE BLADE TRAILING EDGE IS AT THE LARGEST BLADE DIAMETER. SHIM PRIOR TO INSTALLING SCROLL.
2. INSTALL SEAL WITH SMALL DIAMETER GAP IN RINGS FACING OUTSIDE OF HUB.
3. SHIM HUB TO PROVIDE 0.020 IN. (0.508 MM) MINIMUM GAP BETWEEN SCROLL AND IMPELLER.

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Figure 802. 600N5630 Cooling Blower – Cross–Section View

CAUTION In following step, do not use tools or other devices to hold impeller. Tool damage can affect impeller balance. Holding device must not damage shaft splines and must hold shaft with **250 - 300 inch-pounds (28.25 - 33.90 Nm)** of torque applied to impeller retaining nut.

(7). Secure splined end of impeller shaft in holding device meeting requirements of caution above, and remove impeller retaining nut and washer.

CAUTION Be careful to prevent impeller damage. Slight impeller deformation or damage can cause imbalance. Protect shaft threads and use nonmetallic mallet when performing step (8). below.

(8). Manually support impeller and separate impeller from shaft by carefully tapping end of shaft. Remove impeller, scroll, key, spacer and any shimming present.

(9). Remove bolt, retaining ring and spring washer from hub and shroud.

(10). Use non-metallic mallet on splined end of shaft to drive impeller-end bearing, seal, and portion of the shaft from hub. Do not attempt to remove sleeves from hub. Sleeves are line-reamed. If either sleeve is defective, hub must be replaced. Remove inner retaining ring from hub. Remove and discard O-ring in upper sleeve if installed.

(11). If necessary, use pulling device to extract bearing and seal from shaft.

(12). If remaining bearing cannot be driven from hub by tapping outer race from inside with nonferrous tube and mallet, re-insert shaft into bearing, drive bearing out and remove it from shaft as described in steps (10). and (11). above.

(13). Discard bearings. They are not to be re-used.

4. 600N5630 Cooling Blower Reassembly

(Ref. Figure 802)

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM111	Grease, aircraft
CM219	Methyl-ethyl-ketone
CM220	Naphtha aliphatic
CM222	1,1,1-Trichloroethane
CM321	Surface primer locking compound
CM425	Sealing compound
CM431	Sealing, locking and retaining compound

NOTE: Following procedure covers assembly of completely disassembled cooling blower, together with those items (belt, brackets, etc) that form a complete unit. Use only applicable steps of procedure when disassembly is less than complete. New bearings and new seal are required; those removed are not to be reused.

(1). Install inner retaining ring in hub and if removed at disassembly install new O-ring in upper bearing sleeve.

(2). Lightly grease (CM111) smaller bearing journal of shaft, and bore of corresponding bearing.

NOTE: This bearing does not have a metal shield.

(3). Place bearing on shaft so that rubber seal of bearing faces splined end of shaft.

(4). Using tube that contacts only edge of inner race of bearing, arbor-press bearing onto journal until inner race contacts shaft shoulder.

(5). Clean outer race of both bearings and faying surfaces of both hub sleeves with trichloroethane (CM222) and clean cloth or paper towel.

(6). Arbor-press bearing (with shaft installed) into sleeve. Exert pressure only on bearing outer race and on impeller-end of hub casting (no pressure on impeller-end sleeve).

(7). Lightly grease (CM111) larger bearing journal of shaft and bore of remaining bearing.

CAUTION Apply locking compound (CM431) to outer race of lower bearing (impeller end) only. Do not apply locking compound to upper bearing (pulley end).

(8). Apply primer (CM321) and locking compound (CM431) to faying surfaces of outer bearing race and sleeve according to container instructions. Be careful to prevent compounds from entering bearing.

(9). Insert bearing so that shield side (metal disc) faces interior of hub and seal side (rubber disc) faces impeller end of shaft.

(10). Arbor-press bearing simultaneously onto shaft journal and into sleeve. Exert pressure equally on both races of bearing. At same time, exert equal pressure on splined end of shaft and pulley end of hub casting. Bearing is to firmly contact shaft shoulder and inner retaining ring.

WARNING **MEK solvent is flammable. Use only in well-ventilated area and away from heat and flame.**

(11). Wipe away excess locking compound. Use methyl ethyl keytone (CM219) if hardening begins. Leave assembled parts undisturbed to permit locking compound to cure for two hours at 75°-100°F (24°-38°C), or for ten minutes at 220° ±l0°F (105° ±5°C).

(12). Temporarily install lubrication fitting.

NOTE: Install seal with small diameter gap in rings facing outside of hub.

(13). Install new seal, spring washer and outer retaining ring.

(14). Fill hub cavity with grease (CM111) through lubrication fitting until grease seeps out around seal of bearing nearest splined end of shaft. After lubrication, remove lubrication fitting and install screw and washer. Lockwire screwhead.

(15). Install shim on scroll.

(16). Install hub and shroud on scroll with six screws, eight washers and two nuts. Torque screws to **12 - 15 inch-pounds (1.36 - 1.69 Nm)**.

(17). Using feeler gage through an air outlet port, measure for 0.020 inch (0.508 mm) minimum gap between impeller and scroll.

(18). Check for proper thread protrusion of six screws through nutplates and nuts on inside of scroll.

(19). Install spacer and impeller on shaft.

(20). Install washer and locknut on end of shaft. Using holding device on splined end of shaft, tighten locknut sufficiently to remove all end clearance from stack-up of parts.

(21). Using feeler gage through an air outlet port, measure minimum clearance between impeller and scroll lip.

NOTE: If minimum clearance is 0.020-0.030 inch (0.508-0.762 mm), steps (19). and (20). below may be bypassed.

(22). If clearance is more than 0.030 inch (0.762 mm), remove impeller and spacer. Replace spacer with 369H5654 shims as required between impeller and seal to obtain 0.020-0.030 inch (0.508-0.762 mm) clearance. Reinstall impeller, washer and locknut. Tighten to remove all end clearance, and then rotate impeller and check for rubbing. If rubbing occurs, perform step (20)., otherwise proceed to step (21)..

(23). If clearance is less than 0.020 inch (0.508 mm), or if rubbing occurs when performing previous step, disassemble and install shim(s) between seal and spacer to ensure 0.020-0.030 inch (0.508-0.762 mm) minimum clearance and prevent rubbing.

(24). When clearance is properly adjusted, remove impeller, install key, impeller, washer and locknut. Torque locknut to **250 - 300 inch-pounds (28.25 - 33.90 Nm)**. Use care to avoid placing stress on impeller or scroll. Hold splined end of shaft in suitable device.

(25). (Ref. Figure 406) Secure fan mounting bracket on hub with two self-locking bolts, two screws and four washers. Before tightening bolts, fully displace bracket in direction that causes it to be closest to main transmission drive shaft when cooling blower is installed, then torque bolts to **50 - 70 inch-pounds (5.65 - 7.91 Nm)** and screws to **65 - 75 inch-pounds (7.34 - 8.47 Nm)**. Apply slippage mark paint.

(26). (Ref. Figure 406) Install spacer, washer, pulley, washer and nut on shaft. Hold nut on impeller end of shaft with socket wrench and tighten pulley nut to **160 - 190 inch-pounds (18.08 - 21.47 Nm) plus drag torque**.

(27). (Ref. Figure 406) Install belt on pulley and secure mounting bracket to fan mounting bracket with four bolts and washers. Before tightening bolts, fully displace bracket in direction that causes it to be closest to main transmission drive shaft when cooling blower is installed, then torque bolts to **65 - 75 inch-pounds (7.34 - 8.47 Nm)** and lockwire drilled heads.

(28). Clean faying surfaces of scroll and cover with naphtha (CM220); apply sealant (CM425) according to container instructions before securing cover to scroll with eight screws and washers.

5. Cooling Blower Cleaning (Disassembled)

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM234	Solvent, dry-cleaning

(1). Clean all usable metal parts with solvent spray (CM234). Remove remnants of locking compound with loctite remover (CM216).

6. Transmission and Cooling Blower Drain Tube Repair and Replacement

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM702	Lockwire CRES
CM717	Tape, pressure sensitive

(1). Disconnect drain tubes from transmission cooling blower, and from drain fittings and weld assemblies at firewall. Release supporting nylon straps and remove drain tubes (Ref. Figure 601).

(2). Inspect drain tubes, drain fittings, weld assemblies and connectors for damage and clear passage.

(3). Repair damaged flexible drain tubes with tape (CM716).

(4). Install drain tubes as follows:

(a). Attach upper ends of drain tubes to transmission and cooling blower. Secure with double wraps of lockwire (CM702).

(b). Route drain tubes and secure with nylon straps. Position tubes so that no drainage traps are formed.

(c). Secure lower ends of drain tubes to fittings and weld assemblies with double wraps lockwire (CM702).

(d). Insert lower end of metal drain tube through grommet in skin and slip upper end of tube into weld assembly. Wrap tube with one layer of 1 inch (2.54 cm) wide tape (CM717) at clamp-attach point, and install clamp.

7. Installation of Heating System and Oil Cooling Line Standoff Clamps (0003D – 0539D)

(Ref. Figure 803) The following information list a procedure for installing standoff clamps on the 369D292490 heating system hose and on the 369D25710 main rotor transmission oil cooling line to eliminate chafing between the oil cooling lines and chafing of the oil cooling lines by the heating system hose. A protective bushing is also installed to prevent chafing between the oil cooling lines.

(1). Remove aft compartment interior trim panels and left Sta. 124.00 bulkhead access door to gain access to work area.

NOTE: Inspect the 369D292490 heating system hose and 369D25709 and 369D25710 main transmission oil cooling lines for evidence of chafing, kinking or damage at area of L/H aft section channel assembly.

(2). If not already installed, install NAS1713D30N clamp on heating system hose and NAS1713D8N clamp on 369D25710 oil cooling line. Connect clamps with screw, washer and nut.

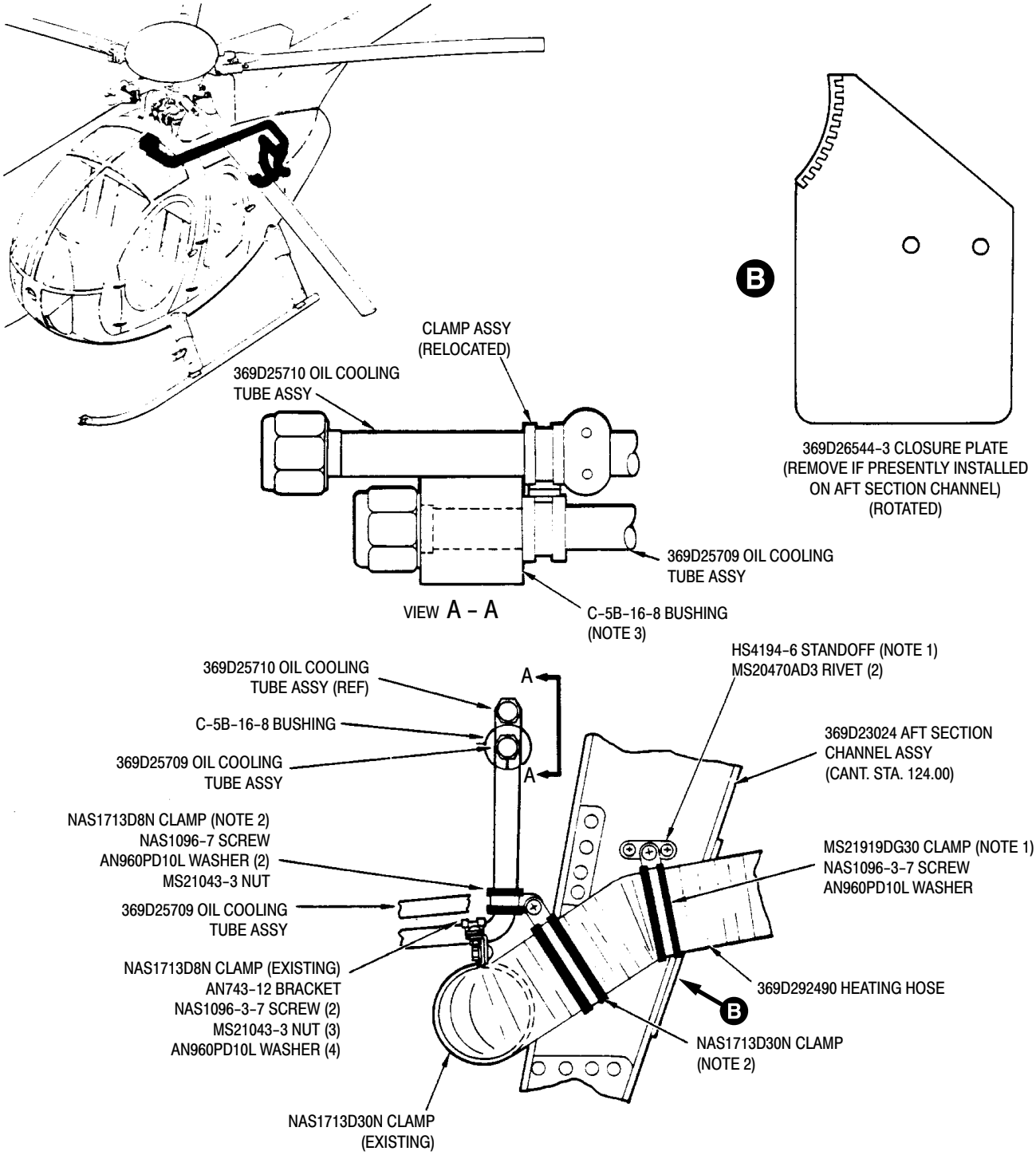
(3). If not already installed, install new C-SB-16-8 bushing snug against nut on 369D25709 oil cooling tube assembly (View A-A). Reposition clamp assembly securing 369D25709 (lower) and 369D25710 (upper) oil cooling tube assemblies to accommodate installation of bushing.

(4). Check installation of standoff clamps to ensure adequate clearance between 369D25709 and 369D25710 oil cooling lines and between oil cooling lines and 369D292490 heating system hose.

NOTE:

- Later Model 369D helicopters have 369D26544-3 closure plate (with grommet) installed on L/H aft section channel. Remove plate from channel, if presently installed, to preclude interference with oil cooling lines.
- Later model 500D helicopters have HS4194-6 standoff bracket installed on channel with MS21919DG30 clamp to secure heating hose. Install standoff bracket and clamp, if not presently installed on helicopter.

(5). Reinstall bulkhead access door and interior trim panels.



NOTES:

1. PRESENTLY INSTALLED ON LATE-MODEL HELICOPTERS.
2. LOCATE NEW CLAMPS APPROXIMATELY AS SHOWN ON COOLING TUBE AND HEATING HOSE ASSEMBLIES.
3. AFTER INSTALLATION OF BUSHING, ROTATE BUSHING SO THAT SPLIT IN BUSHING IS FACING DOWN.

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Figure 803. Installation of Standoff Clamps – Heating and Oil Cooling Lines

TAIL ROTOR TRANSMISSION (TWO AND FOUR BLADE)

MAINTENANCE PRACTICES

1. Tail Rotor Transmission

(Ref. Figure 201) The tail rotor transmission is a right-angle transmission with a magnesium alloy housing. A magnetic chip detector is located on the aft end of the transmission, a breather-filler is located on the top and a sight gage is mounted on the aft end (two-bladed) or on the right side (four-bladed) of the transmission.

2. Tail Rotor Transmission Replacement

A. Tail Rotor Transmission Removal

(1). Disconnect tail rotor driveshaft from transmission (Ref. Sec. 63-15-10).

(2). Disconnect chip detector wire.

(3). (369D/E) Remove four nuts and washers from transmission mount studs.

(4). (369FF) Remove four bolts, eight washers and four nuts between transmission and tailboom extension.

NOTE: Retain any shimming washers that may be between tail rotor transmission and tail boom for transmission installation.

(5). With assistance, support transmission and shaft in line for minimum deflection of coupling and remove tail rotor drive shaft and transmission as a unit.

(6). Remove tail rotor from tail rotor transmission (Ref. Sec. 64-20-00).

(7). Remove tail rotor drive shaft from tail rotor transmission (Ref. Sec. 63-15-10).

B. Tail Rotor Transmission Installation

Consumable Materials
(Ref. Section 91–00–00)

Item	Nomenclature
CM318	Primer

CAUTION Do not carry or otherwise support transmission by coupling, as coupling diaphragm may be permanently distorted. During performance of all maintenance on transmission, use extra care to keep contaminants such as paint, dirt, etc from areas around input and output shaft seals.

(1). Install tail rotor drive shaft on tail rotor transmission (Ref. Sec. 63-15-10).

CAUTION (Ref. Figure 203) Ensure security of tail rotor transmission mount studs. Maximum allowable side play at end of stud is 0.004 inch (0.102 mm), maximum allowable axial play is 0.005 inch (0.127 mm). For stud replacement, refer to the Structural Repair Manual (SRM).

NOTE: Ensure all paint and sealant is removed from mating surfaces. Remove excessive sealant, as required, from transmission to gain clean mounting surfaces. Ensure that no gap in sealant coverage exists around the transmission bearing cover assembly.

(2). Visually inspect mounting studs for damage or deformation. Replace damaged or deformed stud (Ref. SRM).

(3). Apply primer (CM318) in holes, on faying surfaces and on the grip area of the mounting studs. Install tail rotor transmission or tailboom extension while primer is still wet.

(4). With assistance, support transmission and shaft in line for minimum deflection of coupling and install tail rotor drive shaft and transmission as a unit (Ref. Sec. 63-15-10).

NOTE: Note the drag torque for each nut and it's location on the transmission in the helicopter for later use.

(a). (369D/E) Secure tail rotor transmission to four tailboom mounting studs with washers and nuts. Torque nuts to **75 - 95 inch-pounds (8.47 - 10.73 Nm) plus drag torque**.

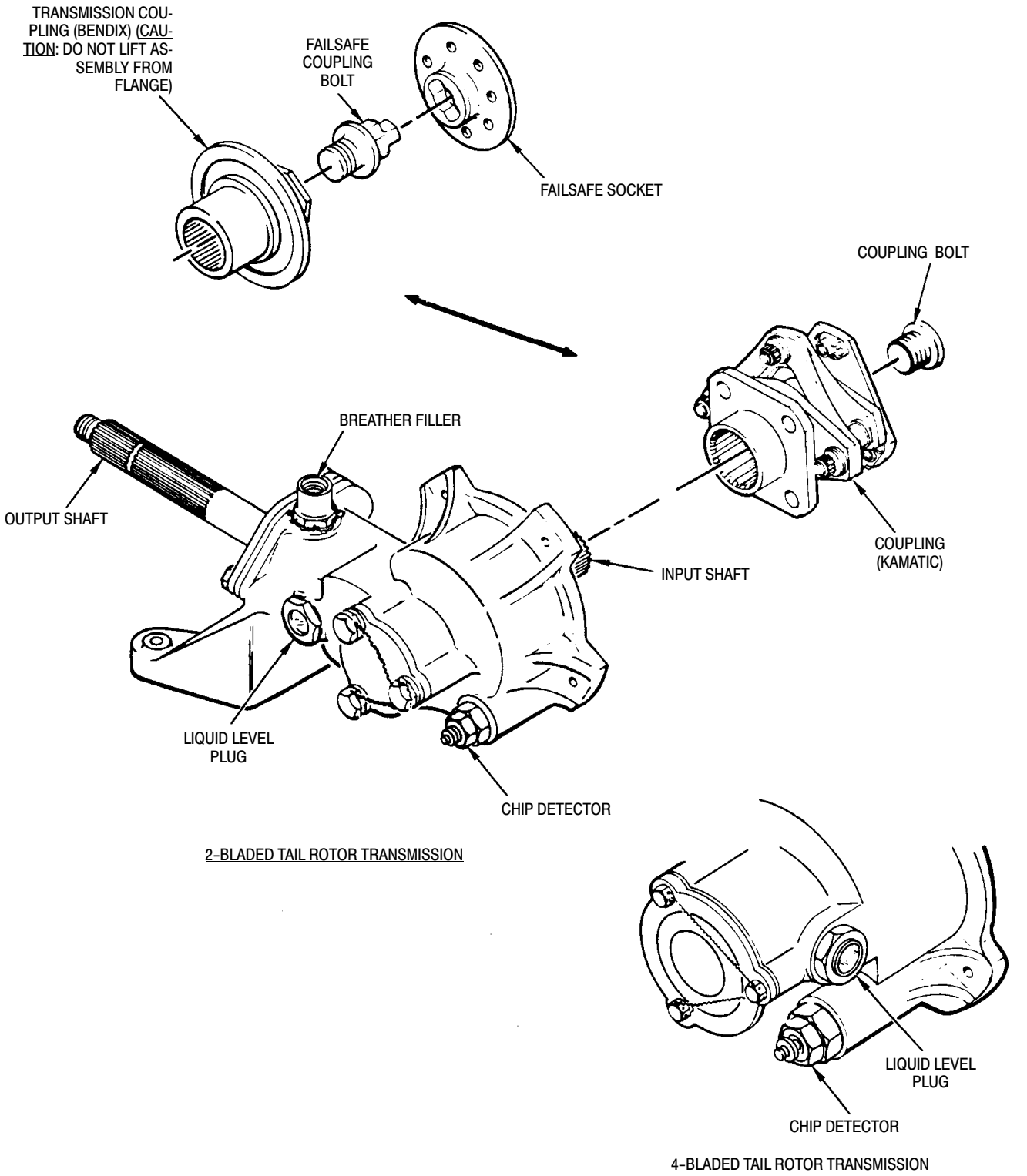


Figure 201. Tail Rotor Transmission – Stripping/Buildup

NOTAR® ANTI–TORQUE SYSTEM FAN TRANSMISSION MAINTENANCE PRACTICES

1. Fan Transmission

The function of the fan transmission is to step up RPM from the main transmission output to the fan via fan drive shaft, gears, and interconnect shaft. The transmission housing is made of magnesium, and contains input and output gear shafts, two angular contact bearings, coupling, seals, packings, output cover assy, chip detector, sight glass, and oil breather assembly.

2. Fan Transmission Replacement

Remove and install fan transmission according to the following procedures.

A. Fan Transmission Removal

(Ref. Figure 201)

(1). Remove inlet screen, inlet fairing, engine plenum access cover, and fan hub transmission fairing (Ref. Sec. 53–30–30).

(2). Remove tailboom (Ref. Sec. 53–40–30).

(3). Drain fan transmission of oil. Disconnect drain line and cap elbow at bottom of transmission.

(4). Remove fan drive shaft (Ref. Sec. 63–15–30).

(5). Remove fan pitch control rod (Ref. Sec. 67–20–30).

(6). Remove fan interconnect shaft (Ref. Sec. 63–15–30).

NOTE: Identify chip detector wires for future re-installation.

(7). Disconnect chip detector wires.

(8). Remove four transmission mounting bolts, washers, and transmission from helicopter.

B. Fan Transmission Installation

(Ref. Figure 201)

CAUTION Do not carry or support transmission by coupling as damage can occur to coupling. During performance of maintenance on transmission, use extra care to keep contaminants such as paint, dirt etc from areas around input and output shaft seals.

(1). Install fan drive shaft (Ref. Sec. 63–15–30).

(2). Locate and align transmission with mounting holes on helicopter. Install four bolts and washers on transmission. Torque bolts to **70 - 90 inch pounds (7.90 - 10.17 Nm)**; torque–stripe bolts.

(3). Connect previously identified chip detector wires.

(4). Remove cap and connect drain line on elbow at bottom of transmission.

(5). Install fan interconnect shaft (Ref. Sec. 63–15–30).

(6). Install fan pitch control rod (Ref. Sec. 67–20–30).

(7). Drain any residual preservative oil (if new transmission) and service with lubricating oil (Ref. Sec. 12–00–00).

(8). Install fan hub transmission fairing (Ref. Sec. 53–30–30).

(9). Install engine plenum access cover (Ref. Sec. 53–30–30).

(10). Install engine inlet fairing (Ref. Sec. 53–30–30).

(11). Install inlet screen (Ref. Sec. 53–30–30).

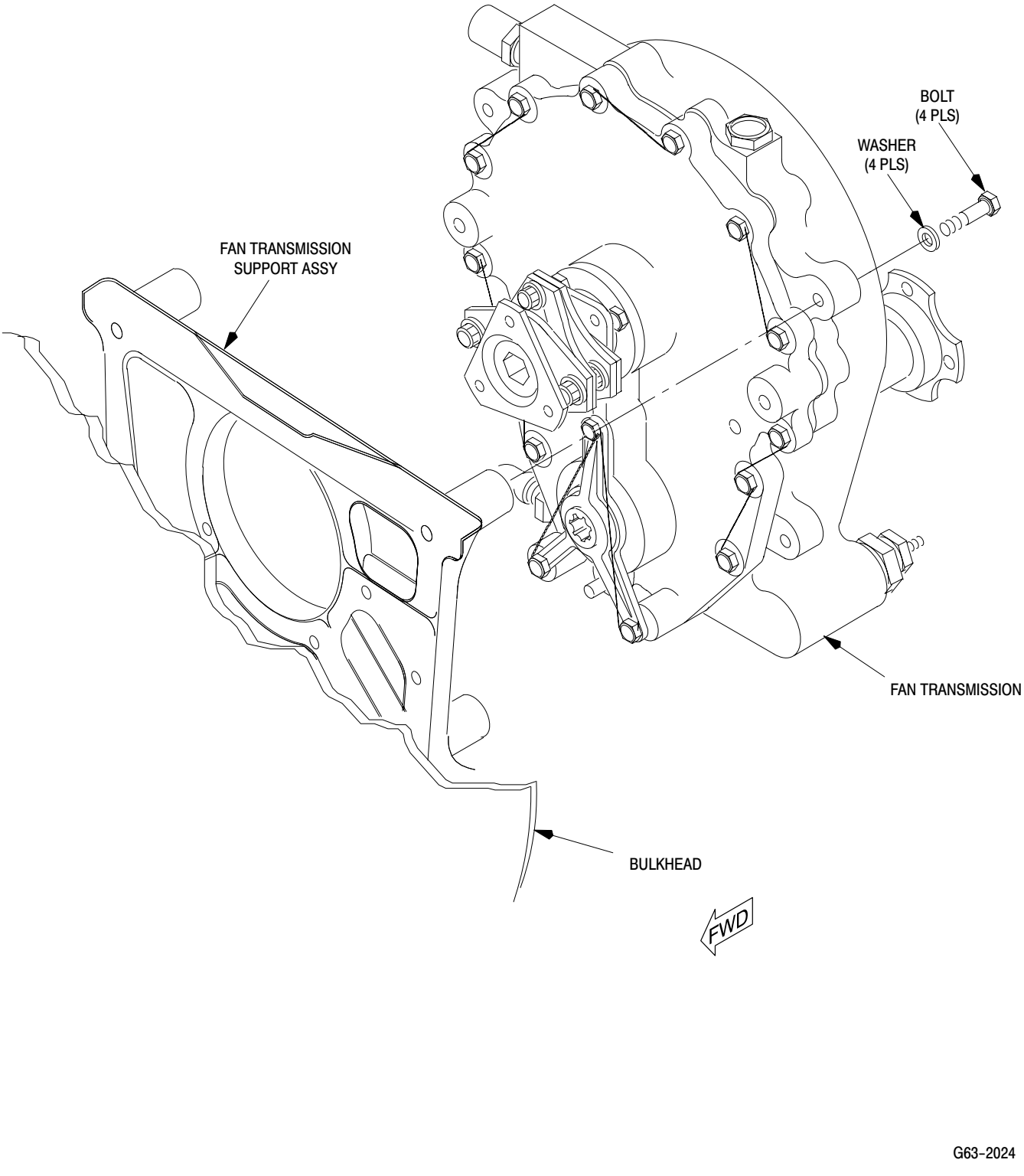


Figure 201. Fan Transmission Removal/Installation

3. Main Rotor Static Mast Replacement (369F5100 Transmission Installation)

(Ref. Figure 202)

A. Main Rotor Static Mast Removal (369F5100 Transmission Installation)

CAUTION Main rotor mast is highly stressed. Do not allow tools to strike mast or mast to strike any object. Any impact damage may require replacement of mast.

(1). Remove main rotor hub (Ref. Sec. 62-20).

(2). Remove main rotor controls (Ref. Sec. 67-10).

(3). Remove main transmission (Ref. Sec. 63-25).

(4). Remove four bolts, washers and nuts.

(5). Lift main rotor mast from helicopter.

B. Main Rotor Static Mast Installation (369F5100 Transmission Installation)

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM306	Lacquer, clear
CM430	Sealant, solvent resistant

(1). Apply silicone sealant (CM430) on bottom surface of mast tube and base at drive shaft opening to seal base to mast support structure at installation.

(2). Position main rotor mast so that holes in base align with holes in mast support structure.

(3). Check underside of mast support structure at left aft stud hole location. Stud-to-pan doubler surface must be clean to bare metal for electrical bonding. Install main transmission mounting bolts, plate spacers and nuts. Torque nuts to **160 - 190 inch-pounds (18.08 - 21.47 Nm) plus drag torque**.

(4). Using 0.0010-0.0015 inch (0.0254-0.0381 mm) feeler gage, check for gap between self-locking nuts and plate spacers. No gap is allowed.

(5). If gap exists, remove nut and replace with new self-locking nut. Torque bolts into replacement nuts to **160 - 190 inch-pounds (18.08 - 21.47 Nm) plus drag torque** and repeat step e. above. Continue until each nut is flush against its spacer. Seal bare bond area with clear lacquer (CM306).

(6). Install main transmission (Ref. Sec. 63-25).

(7). Install main rotor controls (Ref. Sec. 67-10).

(8). Install main rotor hub (Ref. Sec. 62-20).

4. Main Rotor Static Mast Inspection and Repair

(Ref. Figure 203)

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM115	Grease, oscillating bearing
CM234	Solvent, dry-cleaning
CM235	Cleaner
CM304	Enamel, epoxy
CM305	Lacquer, acrylic
CM318	Primer
CM323	Primer
CM713	Tape, pressure sensitive
CM802	Abrasive cloth, aluminum oxide
CM803	Crocus cloth

(1). Inspect all areas of main rotor mast for cracks, nicks, scratches and evidence of impact damage.

(2). Inspect bearing surfaces for scoring and galling.

(3). Inspect threads for damage.

(4). Inspect rivets that secure base to mast tube for security.

(5). Check that tape (Ref. Figure 201) on forward edge of mast tube is secure and undamaged; replace if defective.

(a). Peel defective tape from mast.

(b). As required, polish area to remove burrs and sharp areas with abrasive cloth (CM802) or crocus cloth (CM803).

(c). Clean mast thoroughly with cleaner (CM235) and allow to dry.

(d). Apply primer (CM318) and paint (CM305) to affected area.

(e). Apply pressure sensitive tape (CM713) to mast.

NOTE: To inhibit corrosion of mast when operating in salt water environment, check tape at frequent intervals. Also, apply thin grease film (CM115) to bearing journals.

(6). Inspect internal bore for paint chipping, orange peeling or flaking, none allowed.

NOTE: Chipping, orange peeling or flaking paint will normally be at the base of the static mast tube.

(7). Re-apply finish to mast internal bore as follows:

(a). Remove main rotor hub (Ref. Sec. 62-20-00 or 62-20-60, Main Rotor Hub Replacement).

(b). Remove main transmission (Ref. Sec. 63-20-00 or 63-20-25, Main Transmission Replacement).

(c). Remove static mast (Ref. Main Rotor Static Mast Replacement).

(d). Thoroughly clean interior tube with Solvent (CM234).

(e). Inspect for any corrosion, none allowed.

(f). Remove paint from bad areas and lightly feather paint edge with crocus cloth (CM803), remove any residue from feathering.

(g). Apply primer (CM318), or (CM323), to repair areas.

(h). Allow to cure per manufacturer's instructions.

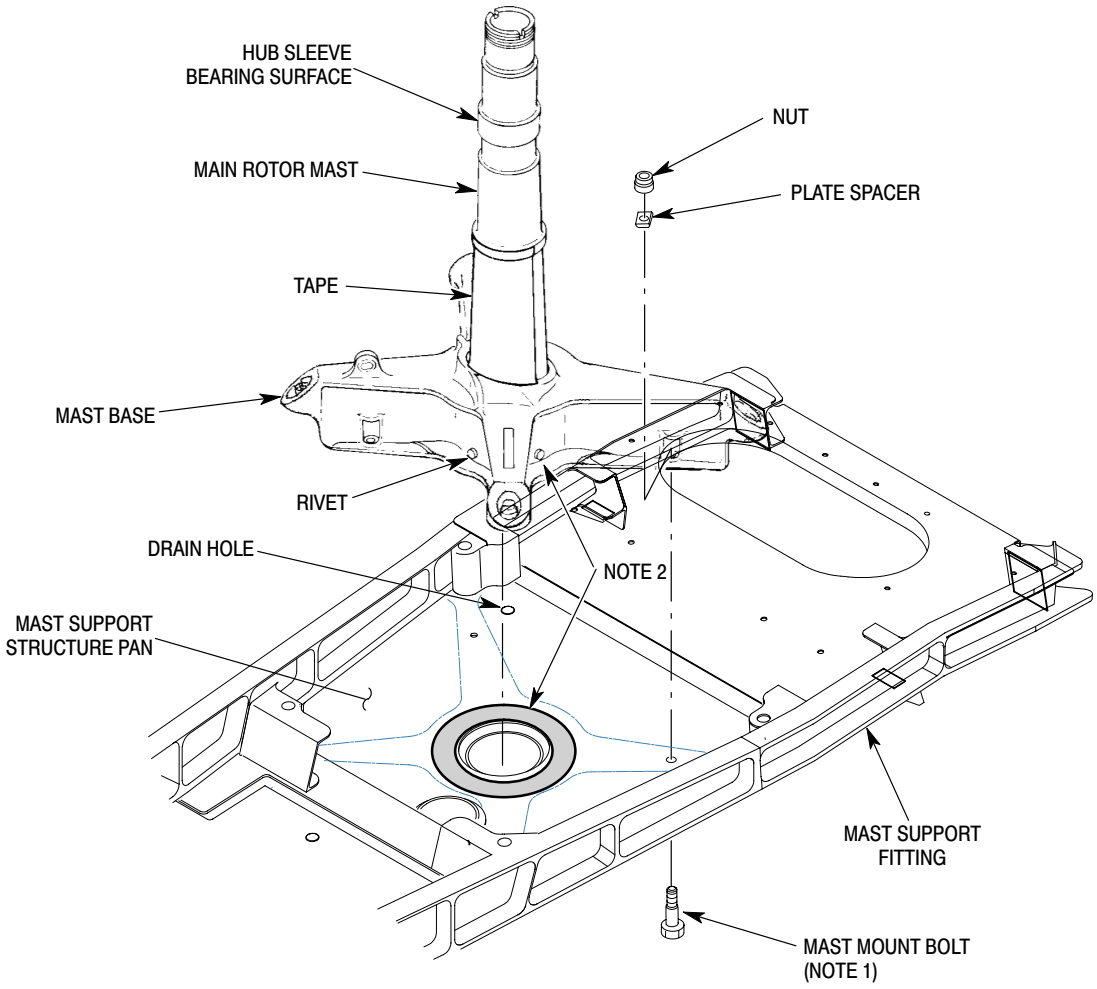
(i). Apply white paint (CM304) to internal bore of mast.

(j). Allow to cure per manufacturer's instructions.

(k). Reinstall static mast.

(l). Reinstall main transmission.

(m). Reinstall main rotor hub.



NOTES:
1. THIS BOLT REQUIRES ELECTRICAL BOND TO STRUCTURAL PAN.
2. MAIN ROTOR MAST IS SEALED TO STRUCTURE PAN (INSIDE MAST TUBE AT BASE) WITH SILICONE RUBBER (CM430).

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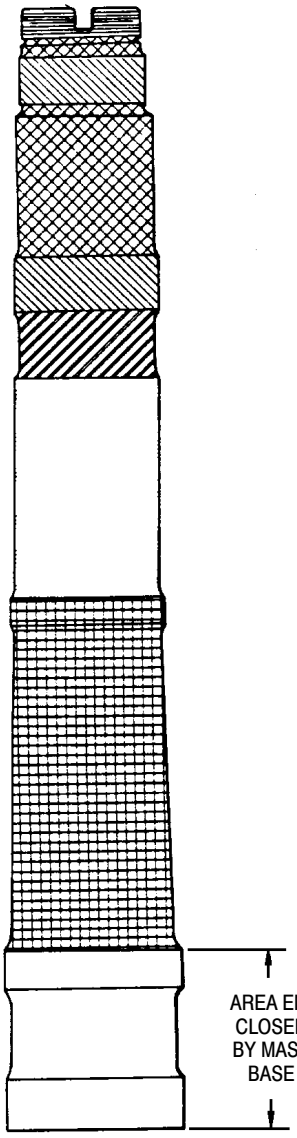
Figure 202. Main Rotor Mast and Support Structure (369F5100 Transmission Installation)



AREA	REPAIRABLE DAMAGE	MAXIMUM REMOVAL OF MATERIAL (DEPTH)	REPAIR PROCEDURE
	CORROSION AND SCRATCHES	0.010 IN. (0.254 MM)	POLISH DEFECTIVE AREA SMOOTH WITH ABRASIVE CLOTH (CM802 AND CM803) IF CADMIUM PLATING HAS BEEN PENETRATED. TREAT REWORKED AREA WITH PRIMER (CM318).
	CHIPPING OF CADMIUM PLATING	THICKNESS OF CADMIUM PLATING (0.0035 IN. (0.0889 MM MAXIMUM)	POLISH AREA SMOOTH WITH ABRASIVE CLOTH (CM802 AND CM803). TREAT REWORKED AREA WITH PRIMER (CM318) AND LACQUER (CM306).
	LONGITUDINAL SCRATCHES THAT DO NOT PENETRATE THROUGH NICKEL PLATE. SCRATCHES MUST BE A MINIMUM OF 0.25 IN. (6.35 MM) APART. RADIAL SCRATCHES ARE NOT PERMITTED.	MUST NOT PENETRATE NICKEL PLATING, 0.003–0.007 IN. (0.076–0.178 MM) THICK	POLISH AREA WITH ABRASIVE CLOTH (CM802 AND CM803) TO REMOVE BURRS AND SHARP EDGES ONLY.
	CORROSION AND SCRATCHES	MUST NOT PENETRATE THICKNESS OF SILVER PLATING BY AN AREA NO LARGER THAN 0.5 $IN.^2$ (3.2258 CM^2). NO MORE THAN TWO SUCH AREAS NO CLOSER THAN 1.5 IN. (3.81 CM) APART MAY EXIST. IF WEAR EXCEEDS LIMITS, CONTACT MDHS WARRANTY REPAIR DEPARTMENT FOR REWORK DISPOSITION. ONLY MDHS CAN PERFORM PLATING REPAIRS.	WIPE AREA CLEAN USING CHEESE CLOTH (CM820) DAMPENED IN SOLVENT (CM222). SPRAY UNIFORM COATING, 0.002–0.005 IN. (0.051–0.127 MM) THICK, ON WORN AREA WITH LUBRICANT (CM103).
	CORROSION AND REPLACEMENT OF TAPE.	0.010 IN. (0.254 MM)	REMOVE DEFECTIVE TAPE. POLISH DEFECTIVE AREAS TO REMOVE BURRS AND SHARP SURFACES WITH ABRASIVE CLOTH (CM802 AND CM803). TOUCH UP REWORKED AREAS WITH PRIMER (CM318) AND LACQUER (CM305). REPLACE TAPE (CM713).

NOTE: FOR MAGNETIC PARTICLE INSPECTION, REMOVE PAINT FROM APPLICABLE SURFACE

G63-3001B

Figure 203. Main Rotor Mast – Inspection and Repair

TAIL ROTOR PITCH CONTROL ASSEMBLY
MAINTENANCE PRACTICES

1. Tail Rotor Pitch Control Assembly

(Ref. Figure 203 and Figure 204) The pitch control assembly consists of a swashplate that rotates in a matched set of two bearings swaged inside a housing. A self-aligning bearing staked in place at the underside of the housing provides a pivot for transferring motion of Sta. 284 bellcrank to the housing. Clevis ears on end of the swashplate provide for connection of pitch control links. Movement of Sta. 284 bellcrank shifts the housing axially on the output shaft of the tail rotor transmission and moves pitch control links inward and outward to change pitch of tail rotor blades. The swashplate is retained in the pitch control housing by a washer and locknut.

2. Tail Rotor Pitch Control Assembly Replacement

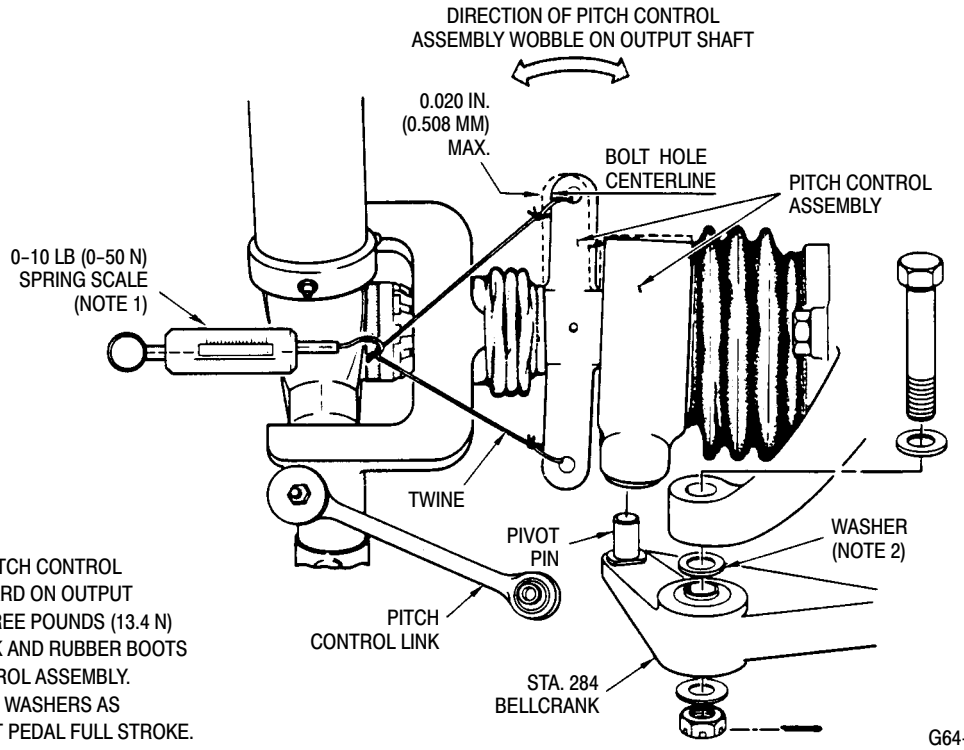
A. Tail Rotor Pitch Control Assembly Removal

(Ref. Figure 203 and Figure 204)

WARNING **On four-bladed tail rotor system, there is strong spring pressure in installed tail rotor linkage. Disconnect the in-line bungee before beginning disassembly. Failure to disconnect the bungee can result in personal injury and/or parts damage.**

(1). Remove tail rotor hub and fork assembly (Ref. Sec. 64-20-00).

NOTE: The manner in which the pitch control assembly is installed determines rotor-blade orientation to transmission splined shaft. Installing rotor blades at 90 degrees to high and low extremes of shaft runout, using reference marks placed on shaft at time of shaft inspection (Ref. Sec. 63-25-10) reduces chance of high-frequency vibration and lessens likelihood of having to rebalance tail rotor.



NOTES:
1. FORCE REQUIRED TO SLIDE PITCH CONTROL ASSEMBLY INWARD OR OUTWARD ON OUTPUT SHAFT MUST NOT EXCEED THREE POUNDS (13.4 N) WITH PITCH LINKS, BELLCRANK AND RUBBER BOOTS DETACHED FROM PITCH CONTROL ASSEMBLY.
2. ADD ONE OR TWO AN960KD516 WASHERS AS REQUIRED FOR CLEARANCE AT PEDAL FULL STROKE.

Figure 201. Pitch Control Assembly – Wobble Check

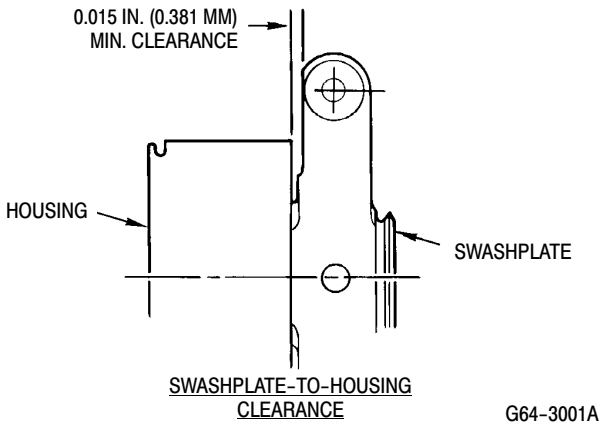


Figure 202. Swashplate–to–Pitch Control Housing Clearance

(2). Remove Sta. 284 bellcrank from transmission (Ref. Sec. 67-20-10) so that pivot pin in bellcrank is disengaged from self-aligning pivot bearing in pitch control housing.

(3). Cut lockwire and pull non-rotating boot from groove in pitch control housing.

(4). Slide pitch control assembly off transmission output shaft.

B. Tail Rotor Pitch Control Assembly Installation

(Ref. Figure 203 and Figure 204)

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM115	Grease, oscillating bearing
CM702	Lockwire CRES

(1). Insert edge of small end of non-rotating boot into tail rotor transmission housing groove. Make certain that drain holes in boot are downward.

(2). Align spline index marks and slide pitch control assembly on shaft.

(3). Insert non-rotating boot edge into groove of pitch control housing and secure with lockwire (CM702).

(4). Apply grease (CM115) to Sta. 284 bellcrank pivot pin, insert pin into pitch housing self-aligning bearing and install Sta. 284 bellcrank. Rotate bellcrank back and forth to align bellcrank bearing with transmission arm.

(5). If previously disconnected, reconnect tail rotor bungee.

3. Tail Rotor Pitch Control Link Replacement

(Ref. Figure 203 and Figure 204)

Consumable Materials (Ref. Section 91–00–00)

Item	Nomenclature
CM318	Primer

CAUTION Prior to removal of pitch control links, color-code pitch arm bolt and all washers used at each arm. The bolt, or an identical one, and same combination of washers must be reassembled at locations from which removed, or tail rotor balance can be seriously affected. Do not allow blade angles to exceed 30 degrees, approximately one inch (2.54 cm), in each direction. Undetected damage to tension-torsion strap pack may occur.

(1). Disconnect ends of pitch control link from clevis ear of swashplate and from blade pitch control arm.

(2). To install, insert either end of pitch control link between clevis ears of swashplate.

(3). Install color-coded attaching hardware and tighten nut to **30 - 40 inch-pounds (3.39 - 4.52 Nm)**; install cotter pin with wet primer (CM318).

(4). Pull pitch control assembly inboard or outboard as required to align pitch control link bearing with pitch control arm bushing.

(5). Place special (reduced outside diameter) washer and large-diameter spring washer on pitch arm bolt so that concave surface of spring washer is against bolt head. With washers in place on bolt, insert bolt through bearing of pitch control link and bushing in pitch control arm.

(21). Install main rotor blades or remove supports and simultaneously lower all six blades to normal position.

(22). Track main rotor blades and adjust autorotation rpm (Ref. Sec. 18-10-00).

9. Cyclic Controls Rigging (R/H Command) (600N)

(Ref. Figure 502 and Figure 503) Rigging of cyclic controls for the R/H command helicopter is accomplished according to instructions for L/H command helicopters except as follows:

Special Tools (Ref. Section 91–00–00)

Item	Nomenclature
ST501	Collective rigging fixture (LH command)
ST503	Mixer rigging plate
ST505	Longitudinal rigging fixture (RH command)
ST507	Lateral rigging fixture (RH command)

(1). Use longitudinal rigging fixture (ST505) on outboard side of longitudinal friction guide, with fixture cutout positioned over friction knob stud. Bushing end of fixture butts against upper end of slot in guide). Secure fixture hook in lower end of slot, tighten knurled thumbnut to seat bushing at upper end, and tighten friction knob.

(2). Use lateral rigging fixture (ST507) on forward side of lateral friction guide, with fixture cutout positioned over friction knob stud. Secure fixture hook in lower inboard end of slot, tighten knurled thumbnut to seat bushing at upper outboard end and tighten lateral friction knob.

10. Gas Producer Linkage Adjustment

(Ref. Figure 504 and Figure 505) Adjust gas producer linkage in installed collective pitch stick(s) and/or inboard socket assembly as follows:

(1). Remove cap and outboard bearing from pilot's collective pitch stick housing.

(2). Remove backlash shims and gear shaft assembly from socket housing.

NOTE: Note locations, mark and measure removed shim thicknesses to ensure reassembly at same places.

(3). Ensure that inboard collective pitch stick socket internal gears are aligned and mated. If gears are correctly aligned and mated, do not perform steps (4). thru (6). and continue with step (7). If gears are misaligned, perform steps (4). thru (6).

(4). Disconnect link from idler and remove link and bellcrank as an assembly from gearshaft of inboard collective pitch stick socket by removing bolt, two washers and nut.

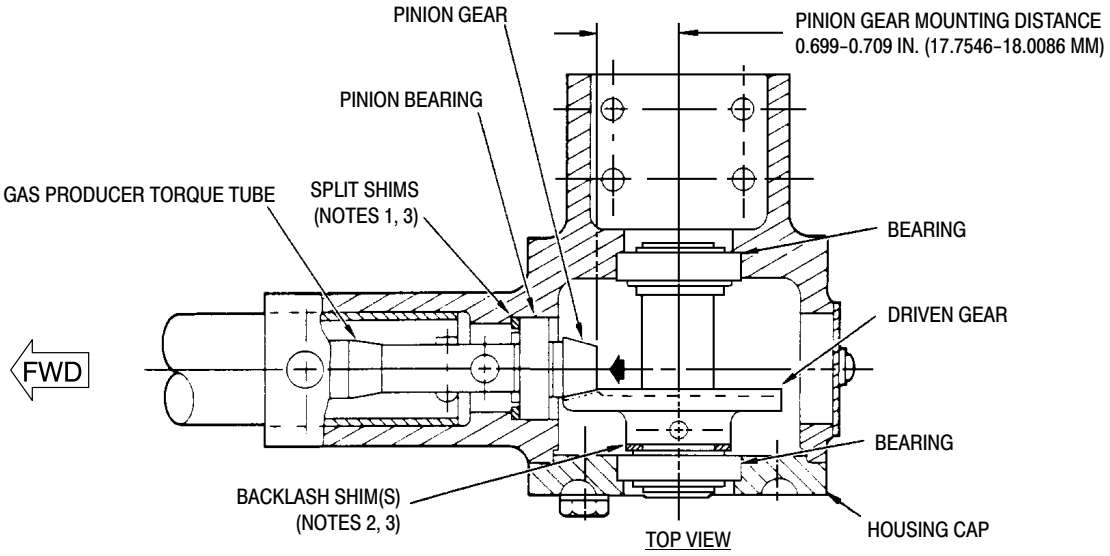
NOTE: During gear shaft rotation to establish correct mid-position for gearshaft and pinion in next step, gearshaft cutout is seen through hole in rear of socket assembly housing.

(5). Rotate end of gas producer interconnect torque tube in pilot's stick socket housing until gear shaft-to-N_1 pinion gearmesh is at mid-travel and N_1 pinion gear wide toothspace is positioned at approximately one o'clock. View pinion by looking aft into open end of collective stick socket.

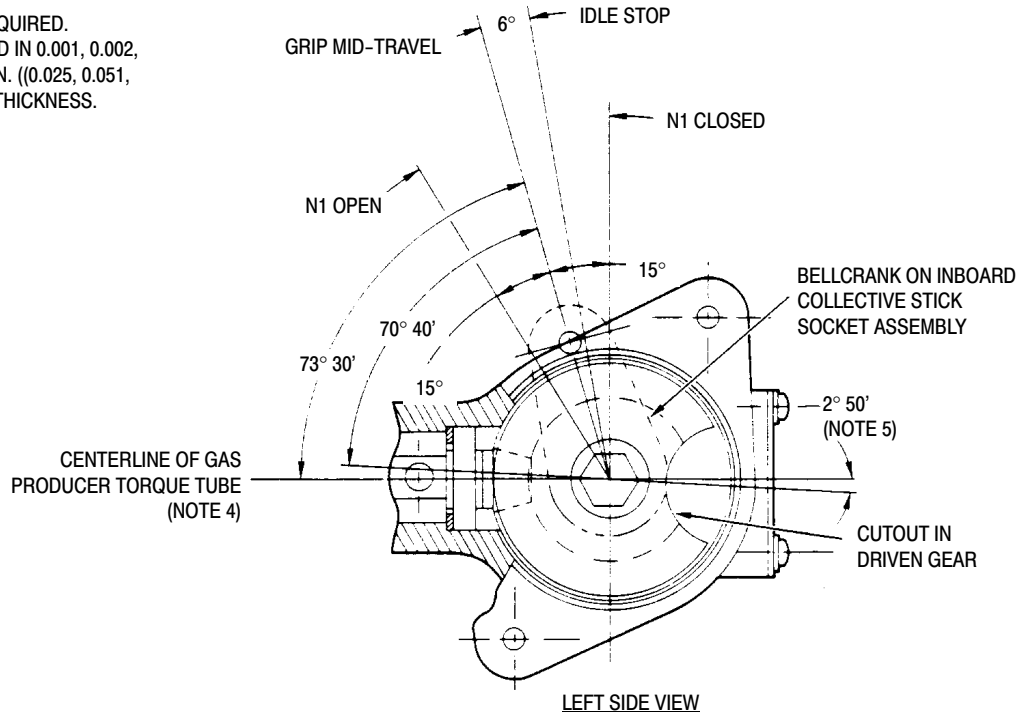
(6). Attach inboard collective pitch stick socket bellcrank to gearshaft and link to idler. Bellcrank attachment bolt must be installed with head slightly down and forward.

NOTE: Inboard collective N_1 pinion gear must be held in correct position while steps (7). thru (9). below are performed. If available, optional copilot's collective pitch stick can be used to hold gear in position by setting copilot's throttle grip attachment bolts at approximately seven o'clock (looking aft) before engaging stick and socket.

(7). With inboard collective pitch stick socket N_1 pinion gear held at position described in step (5)., rotate pilot's collective pitch stick throttle grip to mid-travel position (grip attaching bolts approximately straight down).



GENERAL NOTE:
SHIM SELECTED AS REQUIRED.
STEEL SHIMS PROVIDED IN 0.001, 0.002, 0.005, 0.012 AND 0.032 IN. ((0.025, 0.051, 0.127, 0.305, 0.813 MM) THICKNESS.



NOTES:
1. DETERMINES GEAR MOUNTING DISTANCE.
2. DETERMINES GEAR BACKLASH MAXIMUM 0.003 IN. (0.0762 MM).
3. SELECTED AS REQUIRED; STEEL SHIMS AVAILABLE IN 0.001, 0.002, 0.005, 0.0012 AND 0.032 IN. (0.025, 0.051, 0.127, 0.305, 0.813 MM) THICKNESSES.
4. ALSO CENTERLINE OF PINION GEAR AND CUTOUT IN DRIVEN GEAR.
5. CENTERLINE OF CENTER TOOTH ON DRIVEN GEAR.

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Figure 504. Gas Producer Drive Backlash Adjustment (Outboard Collective Stick)

(8). Measure distance between inboard end of pilot's collective stick assembly housing and inboard face of gas producer gearshaft in pilot's collective stick assembly.

(9). Subtract measurement taken in step (8). from measurement taken in step (7). Remainder is engagement of gas producer interconnecting torque tube with gearshaft in pilot's collective stick assembly.

(10). Subtract engagement (remainder) from 0.750 inch (19.05 mm). In addition to thickness of external snap ring, add PN AN960C816 washers to end of gas producer interconnecting torque tube to a total thickness equal to the remainder from 0.750 inch (19.05 mm) less engagement. Equivalent washers in varying thicknesses may be in combination with PN AN960C816 washers.

(11). Reinstall pilot's collective stick assembly.

(12). Tighten pipe plug of gas producer interconnecting torque tube to obtain zero backlash between torque tube and gearshaft in pilot's collective stick assembly.

(13). Reinstall pilot's seat cover and access door.

13. Collective Stick Friction Mechanism Adjustment

(Ref. Figure 507)

CAUTION For collective friction mechanism to be correctly adjusted for maximum friction, three actions must occur at same time: Drive gear must contact stick fitting fixed stop; spring retainer housing washer must contact retainer internal stop; and gear assembly pin must be at approximate peak of cam. Do not overtighten retainer nut so that retainer washer contacts retainer stop before friction drive gear reaches stick fitting stop. Adjustment that does not produce approximately simultaneous contact will allow excessive additional rotation of drive gear grip and cause nylon gears to be stripped.

(1). Remove friction mechanism guard.

(2). Rotate friction drive gear counterclockwise to maximum friction position.

(3). Remove cotter pin, nut, retainer assembly, teflon washer and one phenolic washer.

(4). Slide gear assembly out far enough to disengage it from idler gear. Use care to keep other washers and spacer from dropping.

(5). Remesh gear assembly with idler gear to position pin on peak of cam. Check that drive gear is still at maximum friction stop position.

(6). If gear assembly does not correctly position pin, reposition idler gear on drive gear.

NOTE: Ratio of idler gear to gear assembly is 3:1, which permits fine adjustment. When repositioning idler gear, be sure to reinstall same number of washers that were removed from between cotter pin and idler. These washers limit gear end play to maximum of 0.010 inch (0.254 mm). When reassembled, gear train must rotate freely.

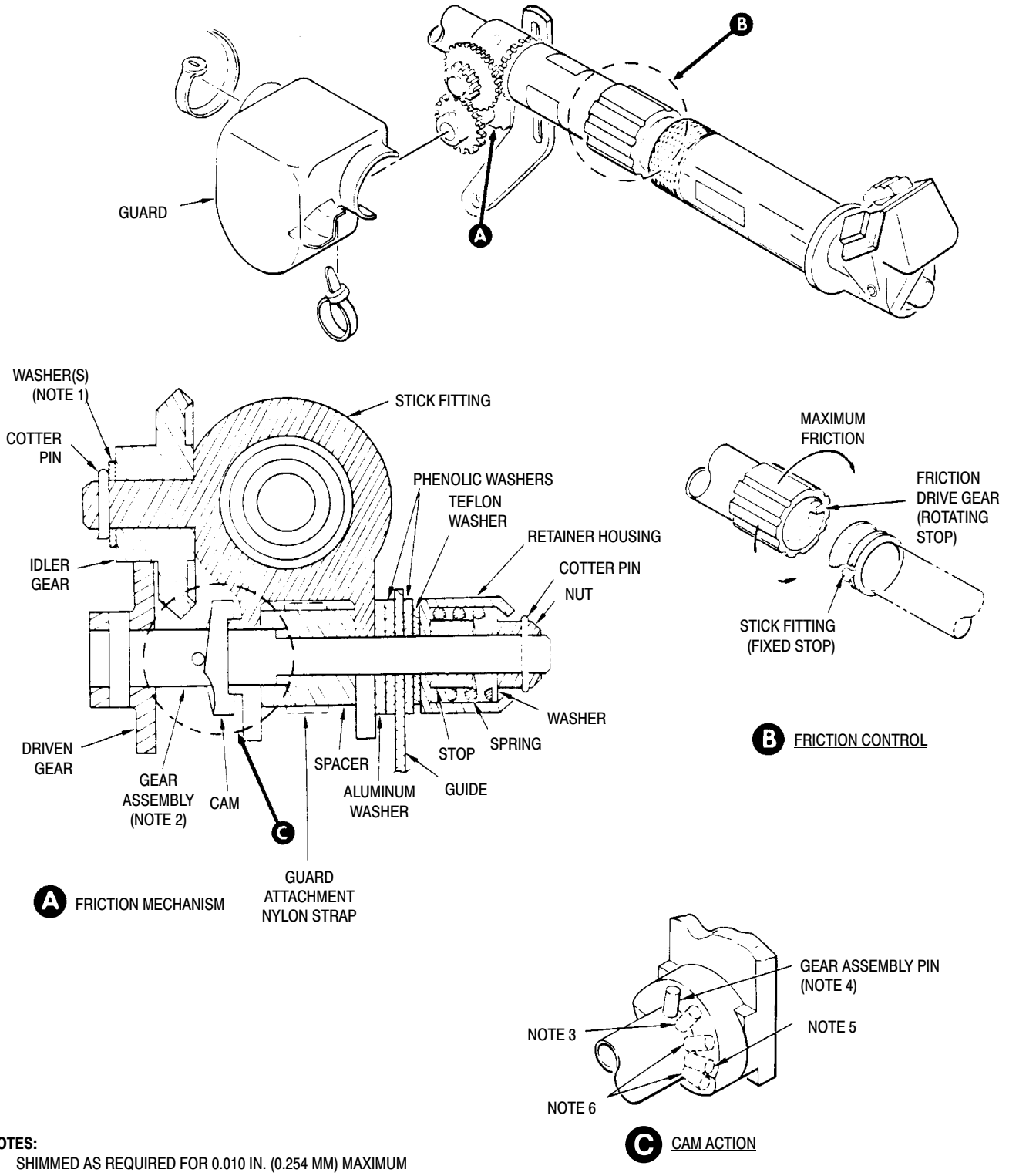
(7). Reinstall phenolic washer, teflon washer, retainer assembly and nut.

(8). With drive gear still at maximum friction position, tighten retainer nut until it just bottoms on retainer stop.

(9). Rotate friction drive gear clockwise to minimum friction stop position, release grip and perform checks in steps (10). and (11). below.

(10). If pin has overridden low point of cam (desired minimum friction position), and grip-to-stick friction prevents springback of pin to cam low point, turn grip and move pin to low point.

NOTE: A drive gear that does not rotate freely on collective stick tube should be replaced.



NOTES:

1. SHIMMED AS REQUIRED FOR 0.010 IN. (0.254 MM) MAXIMUM END PLAY. GEAR TRAIN MUST ROTATE FREELY.
2. GEAR ASSEMBLY MUST SLIDE AND ROTATE FREELY IN FITTING. GREASE APPLIED TO SHAFT.
3. ACCEPTABLE MINIMUM FRICTION POSITION.
4. DESIRED MINIMUM FRICTION POSITION (CAM LOW POINT).
5. CORRECT MAXIMUM FRICTION POSITION (CAM HIGH POINT).
6. UNACCEPTABLE MAXIMUM FRICTION POSITION.

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Figure 507. Collective Stick Friction Adjustment

NOTE: The times in the following charts are maximum times. Some actuators will travel at a greater speed than others. Intervals of less time are acceptable.

Actuator Motor Part number	Time Interval (Seconds)
369A7001	58.4
369A7014 (High Speed)	38.0
369D27001 (Super Fast)	17.5

(7). Measure length of extended ram. Subtract measured result of step (5). above from this value. Result must be 1.92 inches (4.8768 cm) minimum.

CAUTION Do not run actuator against extend limit stop with the 163-pound weight aiding actuation. Actuator thrust bearing may be damaged.

(8). Connect a 163 pound (74 kg) load to actuator. Set switch at RETRACT. Check time it takes ram to travel 1.72-1.78 inches (4.3688-4.5212 cm) to retract stop. Check retraction time for actuator motor tested.

Actuator Motor Part number	Time Interval (Seconds)
369A7001	30–50
369A7014 (High Speed)	15–25
369D27001 (Super Fast)	7–12

(9). Operating current under load conditions must not exceed 1.2 amperes running and 2.0 amperes stalled.

(10). Reduce voltage input to 21 volts. Actuator ram must retract and extend. Overtravel is limited to 0.020 inch (0.508 mm) with an overriding (aiding) load; otherwise there must be no overtravel.

NOTE: It is not necessary to extend or retract actuator ram more than 1/4 inch (6.35 mm) for test in steps (10). above or (11). below.

(11). Increase input voltage to 28 volts. Actuator arm must retract and extend. Overtravel is limited to 0.020 inch (0.508 mm) maximum with an overriding (aiding) load; otherwise there must be no overtravel.

(12). Remove 163 pound (74 kg) load and repeat step (4). above.

(13). Run actuator until arm is extended 1.75 inches (4.445 cm). Turn power off and disconnect cyclic trim actuator.

16. Cyclic Trim Actuator Bench Testing (600N)

(Ref. Figure 508)

(1). Connect cyclic trim actuator to test harness and equipment.

(2). Mount actuator in suitable fixture that allows vertical extension and retraction.

(3). Turn on direct-current power and adjust output to 25.75 - 26.25 volts.

CAUTION During following tests, do not retract spring assembly (ram) so that actuator length is less than 13.50 inches between attach bolt centers.

(4). With actuator spring assembly (ram) approximately halfway between travel limits (actuator length at 14.46 inches (36.7284 cm) between attach bolt centers), set up test dial indicator and measure ram end play. End play must be within 0.010-0.050 inch (0.254-1.27 mm). While adjusting screw, check that there is thread-locking friction from self-locking threaded insert. If end play is excessive, replace actuator.

NOTE: When power is applied to the 8222M21 (600N7001) actuator, it will move, as commanded, and if power is applied simultaneously in the opposite direction, it will stop. When one of the inputs is removed, the actuator may or may not start. If it does not restart, it has been latched into the off state by the current surge generated upon applying the second input. The actuator has a built-in current limit circuit that latches it off if the actuator current exceeds 3.1 amp. All power must be removed in order to unlatch it.

(5). Position test switch to RETRACT and allow actuator ram to retract to a length of 13.50 inches (34.29 cm) between attach bolt centers.

(6). Using stopwatch, check actuator ram travel time from fully retracted to fully extended. Check time interval for actuator motor tested.

NOTE: The time in the following chart is maximum time. Some actuators will travel at a greater speed than others. Intervals of less time are acceptable.

Actuator Motor Part number	Time Interval (Seconds)
600N7001–1 (longitudinal)	6.6
369D27001–3 (lateral)	11.0
600N7014–1 (lateral, with YSAS)	11.0

(7). Measure length of extended ram. Subtract measured result of step (5). above from this value. Result must be 1.92 inches (4.8768 cm).

CAUTION Do not run actuator against extend limit stop with the 163-pound weight aiding actuation. Actuator thrust bearing may be damaged.

(8). Connect a 163 pound (74 kg) load to actuator. Set switch at RETRACT. Check time it takes ram to travel 1.72-1.78 inches (4.3688-4.5212 cm) to retract stop. Check retraction time for actuator motor tested.

Actuator Motor Part number	Time Interval (Seconds)
600N7001–1 (longitudinal)	7–12
369D27001–3 (lateral)	7–12
600N7014–1 (lateral, with YSAS)	7–12

(9). Operating current under load conditions must not exceed 1.2 amperes running and 2.0 amperes stalled.

(10). Reduce voltage input to 21 volts. Actuator ram must retract and extend. Overtravel is limited to 0.020 inch (0.508 mm) with an overriding (aiding) load; otherwise there must be no overtravel.

NOTE: It is not necessary to extend or retract actuator ram more than 1/4 inch (6.35 mm) for test in steps (10). above or (11). below.

(11). Increase input voltage to 28 volts. Actuator arm must retract and extend. Overtravel is limited to 0.020 inch (0.508 mm) maximum with an overriding (aiding) load; otherwise there must be no overtravel.

(12). Remove 163 pound (74 kg) load and repeat step (4). above.

(13). Run actuator until arm is extended 1.75 inches (4.445 cm). Turn power off and disconnect cyclic trim actuator.

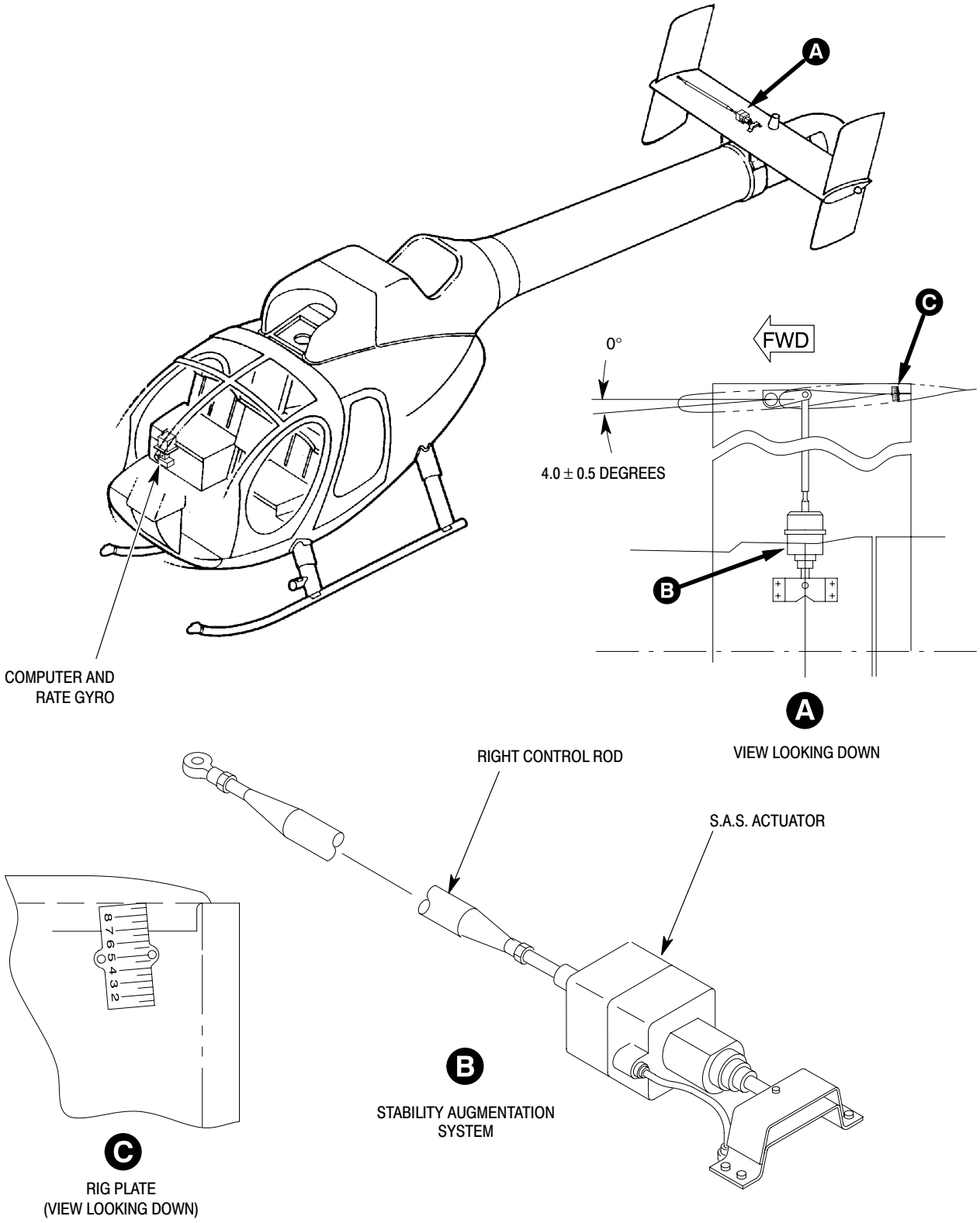

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Figure 505. Stability Augmentation System S.A.S. (Sheet 1 of 2)

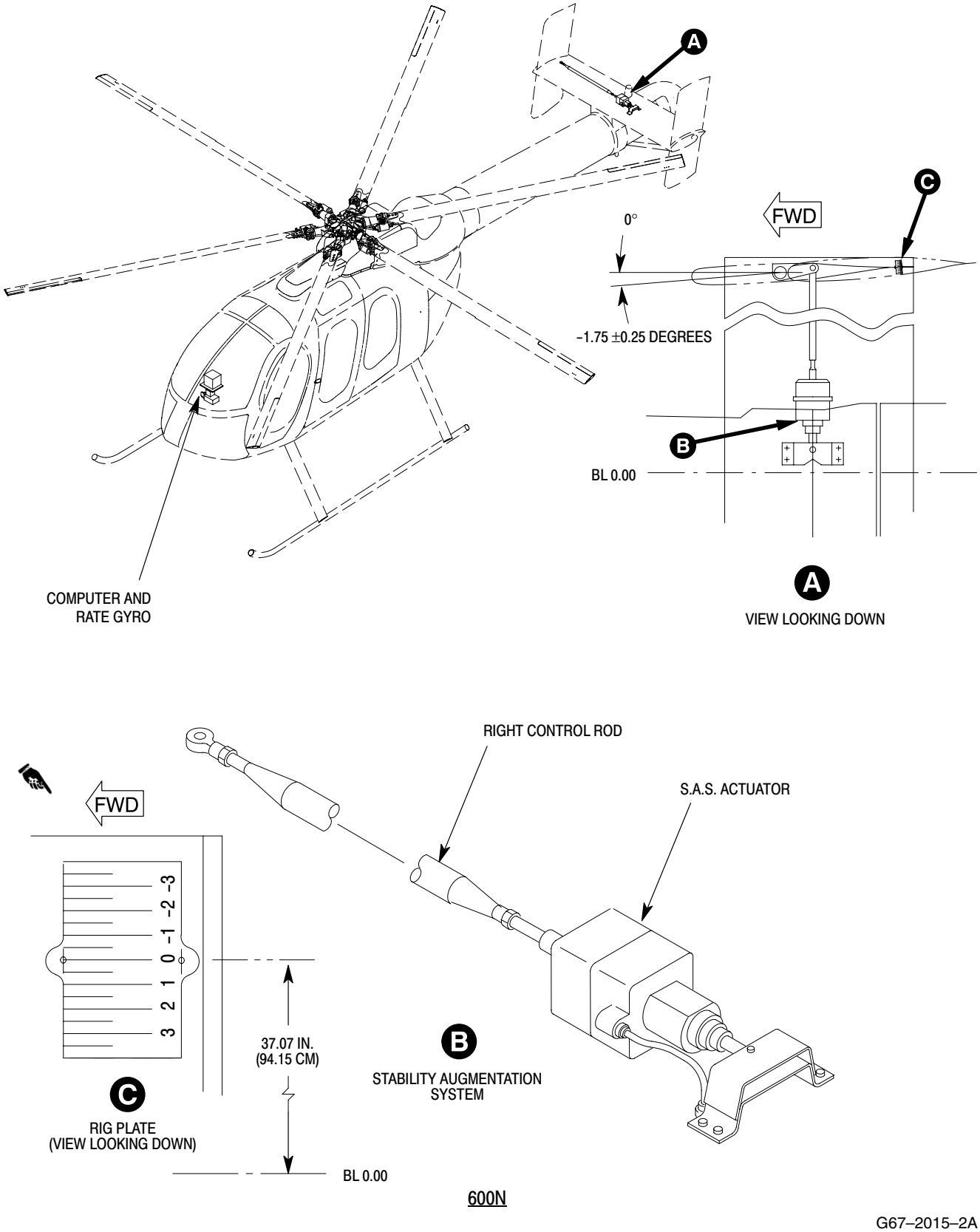

Figure 505. Stability Augmentation System S.A.S. (Sheet 2 of 2)

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inch-pounds (24.85 - 40.66 Nm). Safety bolts with lockwire (CM702).

(9). Align hole in lower engine mount assembly with engine fitting. Install bolt, washers and nut. Torque nut to **95 - 110 inch-pounds (10.73 - 12.43 Nm)**.

(10). Ensure inlet seal assembly contacts firewall around its entire circumference.

(11). Remove hoist from helicopter.

(12). Perform engine to transmission alignment if applicable (Ref. CSP-SRM-6, Section 53-30-00).

(13). Using a mirror and light, check for clearance between airframe and bleed valve, any clearance is acceptable.

(14). If bleed valve contacts firewall, readjust engine mounts for clearance.

(a). Move engine back by adjusting the left and right mounts, increasing the top and decreasing the bottom.

(b). Only make adjustments one flat at a time until bleed valve clears firewall.

NOTE: One flat will move the engine approximately 0.020 inch (0.508 mm) aft.

(c). Adjust lower mount to insure no preload exists.

(d). Perform engine to transmission alignment if applicable (Ref. CSP-SRM-6, Section 53-30-00).

D. Connecting an Installed Engine

(Ref. Figure 401 and Figure 402)

WARNING **Proper tightening of engine tubing connections is critical to flight safety. Correct torque values must be used at all times. Excessive torque on fuel or pneumatic sensing system connections can result in cracking of the flare causing an air leak which can cause flameout, power loss, or overspeed.**

(1). Connect torquemeter indicator oil line to bulkhead union on firewall. Torque tube nut to **75 - 85 inch-pounds (8.47 - 9.60 Nm)**.

(2). Connect oil pressure gauge line to bulkhead union on firewall. Torque tube nut to **75 - 85 inch-pounds (8.47 - 9.60 Nm)**.

(3). Connect engine oil vent line. Torque hose nut to **230 - 260 inch-pounds (25.98 - 29.36 Nm)**.

CAUTION Do not bend oil return line. Bending loads are transferred to oil cooler port and may fracture cooler.

(4). Connect engine oil out line to elbow. Torque hose nut to **230 - 260 inch-pounds (25.98 - 29.36 Nm)**.

(5). Connect engine oil in line to union. Torque hose nut to **460 - 500 inch-pounds (51.96 - 56.48 Nm)**.

(6). Connect customer bleed air line to elbow. Torque hose nut to **460 - 500 inch-pounds (51.96 - 56.48 Nm)**.

(7). Connect engine fuel pump seal drain line. Torque tube nut to **50 - 65 inch-pounds (5.64 - 7.34 Nm)**.

(8). Connect fuel inlet line to fuel pump. Torque hose nut to **230 - 260 inch-pounds (25.98 - 29.36 Nm)**.

NOTE: Ensure burner drain valve and plug are installed in combustion chamber with an O-ring on each part. Ensure drain valve is in the aft (lowest) position.

(9). Install combustion chamber drain line on drain valve. Torque tube nut to **50 - 65 inch-pounds (5.64 - 7.34 Nm)**.

(10). Attach engine electrical connectors.

(a). Attach engine electrical wire harness to to airframe connector at firewall.

(b). Attach fuel pressure bypass switch splice connector.

(c). Attach starter/generator electrical connections (Ref. Figure 403).

(11). Install main transmission drive shaft (Ref. Sec. 63-10-00).

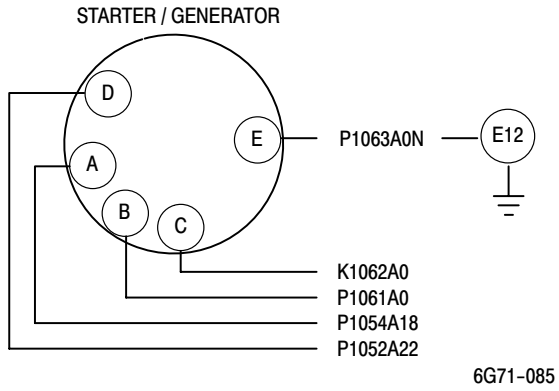


Figure 403. Starter/Generator Electrical Connections

(12). Install cooling air ducts and air duct support bracket on airframe hoist fitting. Connect ducts and tighten clamps on firewall coupling and oil cooler deflector.

(13). Install compressor bleed hose and tighten clamps.

(14). Install starter cooling air duct and tighten clamps.

(15). Install exhaust duct (Ref. Sec. 78-00).

(16). Connect and rig engine control cable (Ref. Chap. 76).

WARNING **After each opening, removal or replacement of any part of the engine and/or aircraft fuel system between the aircraft fuel tank and the engine fuel nozzle, the fuel system must be bled to remove trapped air. Failure to comply with this procedure can result in engine flameout or power loss.**

(17). Perform fuel system bleed (Ref. Chap. 28).

(18). Perform an engine deceleration check per the Pilot's Flight Manual.

NOTE: Make engine adjustments per the Allison Engine Operation and Maintenance Manual.

(19). Perform an anti-icing system operational check (Ref. Chap. 75).

(20). Inspect engine installation and connections for proper routing and security.

2. Model 250–C47 Engine Stripping

(Ref. Figure 401)

Special Tools
(Ref. Section 91–00–00)

Item	Nomenclature
ST401	Engine stand
ST402	Engine hoist

CAUTION Cap fluid lines and fittings with approved devices. Do not use tape to cover fuel and oil openings. Tape adhesives loosened by fuel or oil can contaminate systems.

NOTE: Discard all used O-ring packings.

(1). Remove engine control box from HMU.

(2). Remove reducers from HMU.

(3). Remove starter/generator.

CAUTION Always support the weight of the starter/generator during removal/installation. Damage can occur if weight is supported by the shear shaft.

(a). Loosen V-clamp and remove starter/generator.

(b). Remove bolts, washers, mounting flange and gasket.

(4). Remove oil vent line and associated hardware.

(5). Remove fuel inlet fitting.

(6). Remove unions from oil in port and oil tank vent unions from gearcase.

(7). Remove oil pressure tube, clamps and attaching hardware and reducer/snubber.

(8). Remove torquemeter tube, clamps and attaching hardware and expander.

(9). Remove customer bleed air line, associated clamps and hardware and fitting.

(10). Remove N_1 and N_2 tachometer generators and gaskets.

ENGINE AIR PARTICLE SEPARATOR DESCRIPTION AND OPERATION

1. Description and Operation

(Ref. Figure 1)

(1). MDHI 369/500 helicopters may be equipped with an optional engine inlet air particle separator filter installation in place of the standard engine air inlet screen.

(2). Later model helicopters are equipped with a Aircraft Porous Media (APM) filter. Earlier 500D helicopters were fitted with a Donaldson particle separator. The APM unit is equipped with provisions for an optional mist eliminator installation.

(3). Both the APM and Donaldson particle separators are installed inside the front of the aft intake fairing above the plenum chamber and utilize the same operating principle. The particle separator installation consists of vortex tubes, a collection chamber, a nozzle manifold, ejectors, flapper valve, seals and attaching hardware. A scavenge air system is used to remove trapped particles from the collection chamber with engine bleed air. The scavenge air system consists of a solenoid air valve, tubes, an air pressure switch, SCAV AIR circuit breaker switch, AIR FILTER CLOGGED caution light, wiring, and attaching hardware. An air bypass door system is included to allow the particle separator to be bypassed in the event the unit becomes clogged. The air bypass door system includes a hinged plenum chamber door, door latches, door actuating forward and aft cables, cable return spring, two retainers, three cable pulleys, adjustable cable stop, handle and attaching hardware.

(4). An optional mist eliminator may be fitted to the back of APM separators to filter liquid sprays out of engine inlet air. Nine self retaining bolts secure early mist eliminator installations to the aft face of the particle separator. Later installations feature a system of clips that retain the mist eliminator in sealed contact with the particle separator. The mist eliminator consists of a welded stainless steel frame and wire mesh screens on the fore and aft faces.

(5). Air drawn through the particle separator by the engine passes through the parallel vortex tubes. Each tube is fitted with vanes and an opening to the particle collection chamber. The vanes spin the incoming air so that centrifugal force separates heavier solid bits from the air flow. A smaller diameter tube directs particle free center vortex tube air through the collection chamber rear plate into the plenum chamber. When the scavenge air system is switched ON, trapped particles are drawn out of the collection chamber by scavenge air vacuum and discharged overboard through an opening in the right side of the aft inlet fairing of APM equipped helicopters and the left side on Donaldson equipped machines. The nozzle manifold is fitted with an engine bleed air inlet port and air jets to discharge contaminants. The ejector assembly consists of a mounting flange with tubes, duct assembly and flapper valve.

(6). The scavenge air system is supplied compressor bleed air controlled by the solenoid air valve. Bleed air is delivered to a duct-mounted nozzle-manifold that ejects contaminants from the particle separator. The electrically actuated solenoid air valve is mounted on the left forward side of the Station 124.00 bulkhead. The valve is controlled by the SCAV AIR circuit breaker switch on the instrument panel.

(7). An increase in plenum chamber vacuum (reduced plenum chamber pressure) caused by reduced airflow through a clogged filter/mist eliminator is sensed by a differential pressure switch ported to the plenum chamber and particle separator inlet. Sufficient

pressure differential causes the switch to close. Switch closure lights an AIR FILTER CLOGGED caution indicator on the instrument panel. A cable actuated filter bypass door on the plenum chamber wall may be opened by the pilot to allow the engine to operate on unfiltered air.

(8). Pulling the FILTER BYPASS CONTROL handle in the crew compartment disengages two door latches inside the engine air inlet aft fairing and opens the door inward. A spring and two retainers on the aft end of the forward cable returns the handle to the stowed position. An adjustable stop provides for cable travel adjustment and air bypass door rigging.

On 500N installation, the FILTER BYPASS CONTROL handle in the crew compartment disengages one door latch inside the air inlet aft fairing and opens the door inward. Adjustment of this cable installation is limited by repositioning the cable assembly.

Table 1. Engine Air Particle Separator Configurations

Model	Part Number	Cabin Heat	Principal Features
500N	500N90148–3	No	APM filter with new pressure switch and T–pedestal electrical installation.
	500N90148–1	Yes	
530FF	369H90148–543	No	APM filter with generic wire harness and no cabin heat
	369H90148–541	Yes	APM filter with generic wire harness and cabin heat
	369H90148–529	No	APM filter with new pressure switch and T–pedestal electrical installation.
	369H90148–527	Yes	
500E	369H90148–545	Yes	APM filter for C20R engine with generic wire harness
	369H90148–539	No	APM filter for C20R engine with generic wire harness
	369H90148–537	No	APM filter for C20B engine with generic wire harness
	369H90148–535	Yes	APM filter for C20B engine with generic wire harness
	369H90148–521	No	APM filter with T–pedestal electrical installation.
	369H90148–519	Yes	
500D	369H90148–509	No	APM filter with electrical controls bracket on side of slimline pedestal.
	369H90148–507	Yes	
	369H90148–505	No	Donaldson filter with electrical controls bracket on side of slimline pedestal. No mist eliminator option.
	369H90148–503	Yes	

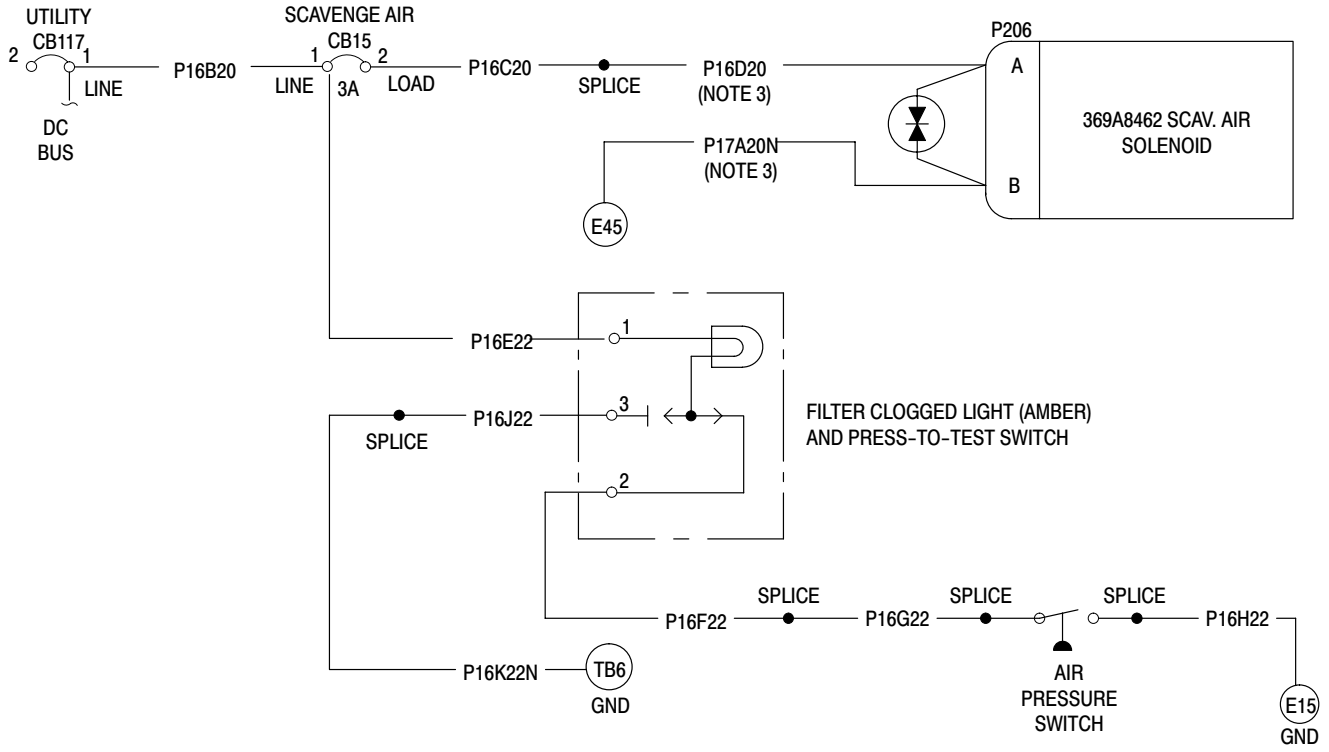
ENGINE AIR PARTICLE SEPARATOR

FAULT ISOLATION

1. Engine Air Particle Separator Fault Isolation

Table 101. Engine Air Particle Separator Fault Isolation

Symptom	Probable Trouble	Corrective Action
Turbine outlet temperature (TOT) gage indicates a moderate temperature increase with all other indications normal.	Partially blocked particle separator and, or mist eliminator.	Clean and service particle separator installation.
FILTER CLOGGED caution light on. Light goes out when air bypass door is opened.	Clogged filter.	Clean and service particle separator installation.
Filter requires frequent cleaning. Loads up with SCAV AIR, ON and functioning.	Inadequate scavenge air flow; leaking scavenge air bleed air lines.	Inspect scavenge air system for leakage. Repair system as required.
	Solenoid air valve blocked.	Clean solenoid air valve.
FILTER CLOGGED caution light fails to come on when filter is clogged.	Lamp failed.	Replace lamp.
	Disconnected, open or loose wiring.	Check continuity, repair or replace wiring.
	Faulty air pressure switch.	Replace pressure switch.
FILTER CLOGGED caution light stays on regardless of bypass door position.	Defective light assembly.	Replace light assembly.
	Defective air pressure switch.	Replace air pressure switch.
	Wiring problem.	Repair wiring.
FILTER CLOGGED caution light fails to come on when air filter is clogged but works when tested.	Defective wiring.	Repair wiring.
	Defective air pressure switch.	Replace air pressure switch.
FILTER BYPASS CONTROL handle is pulled but bypass door fails to open.	Disconnected or broken cable.	Repair or replace cables.
Air bypass door does not open all the way when FILTER BYPASS CONTROL handle is pulled to forward limit.	Cable stop out of adjustment.	Adjust cable stop.
FILTER BYPASS CONTROL handle fails to return to full aft position after control actuation.	Defective return spring.	Replace return spring.
	Cable kinked, worn or binding.	Repair or replace cable assembly.
No air is exhausted through outlet duct with SCAV AIR circuit breaker ON and engine running.	Defective wiring.	Repair wiring.
	Disconnected or damaged scavenge air line.	Connect or replace scavenge air line.
	Defective solenoid air valve.	Replace solenoid air valve.



NOTES:

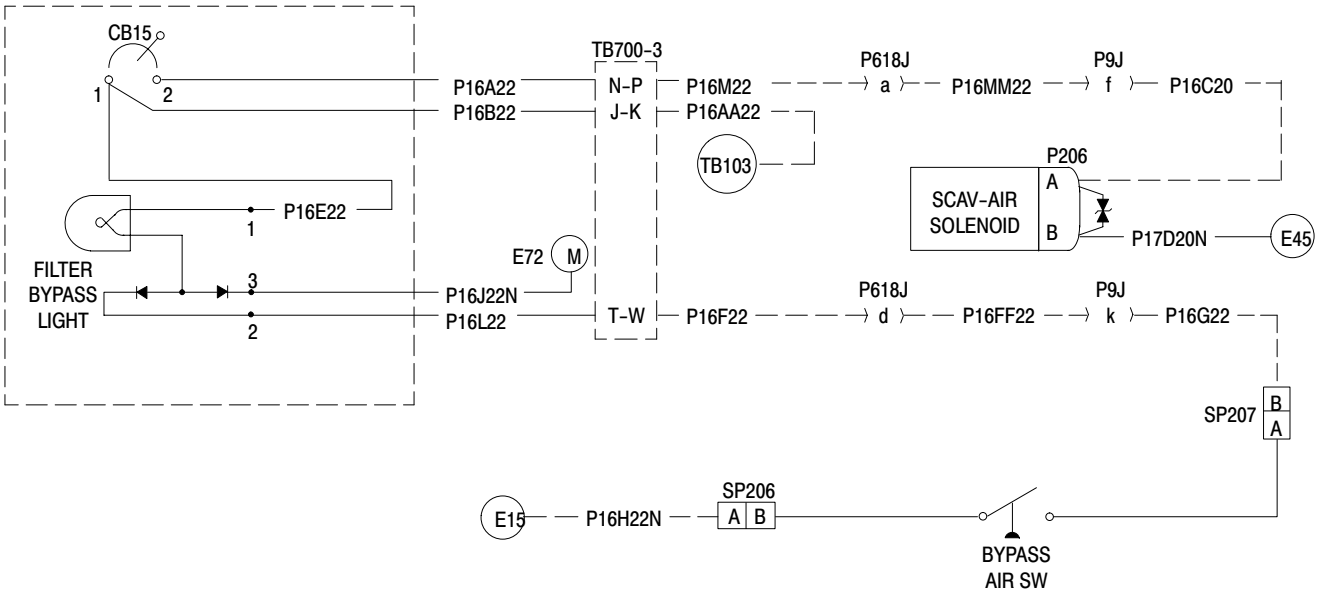
1. THIS WIRING DIAGRAM SHOULD BE USED WITH THE ELECTRICAL SYSTEM WIRING DIAGRAM IN CSP-HMI-3 FOR COMPLETE CIRCUIT INTERCONNECT AT INSTALLATION.
2. ASTERISK (*) INDICATES WIRE IS CUT TO LENGTH AT INSTALLATION.
3. PART OF WIRE HARNESS 369D24163.

G71-1002-1A

WIRE LIST

WIRE NO.	LENGTH	FROM	TERMINATION	TO	TERMINATION
P17A20N	–	P206–B	–	E45	–
P16K22N	72.0*	SPLICE	32445	TB6	MS25036–101
P16J22	10.0	LIGHT – 3	SOLDER	SPLICE	32445
P16H22	72.0*	SPLICE	32445	E15	MS25036–103
P16G22	204.0*	SPLICE	32445	SPLICE	32445
P16F22	12.0	LIGHT – 2	SOLDER	SPLICE	32445
P16E22	3.0	CB15 – LINE	MS25036–149	LIGHT – 1	SOLDER
P16D20	–	SPLICE	–	P206–A	–
P16C20	240.0*	CB15 – LOAD	MS25036–149	SPLICE	32445
P16B20	72.0*	CB117 – LINE	MS25036–149	CB15 – LINE	MS25036–149

Figure 101. 369H90148–503, –505, –507, –509 Particle Separator Installation Wiring Diagram (Slim–Line Panel)



NOTES:

1. APPLICABLE TO 369D MODEL, S/N 1222 AND SUBS. WITH T-PANEL AND CENTER ELECTRICAL CONSOLE.
2. EXISTING WIRING IS SHOWN PHANTOMED. WIRE TO BE INSTALLED IS SOLID.

G71-1002-2

Figure 102. 369H90148–503, –505, –507, –509 Particle Separator Installation Wiring Diagram (T–Panel with Center Console)

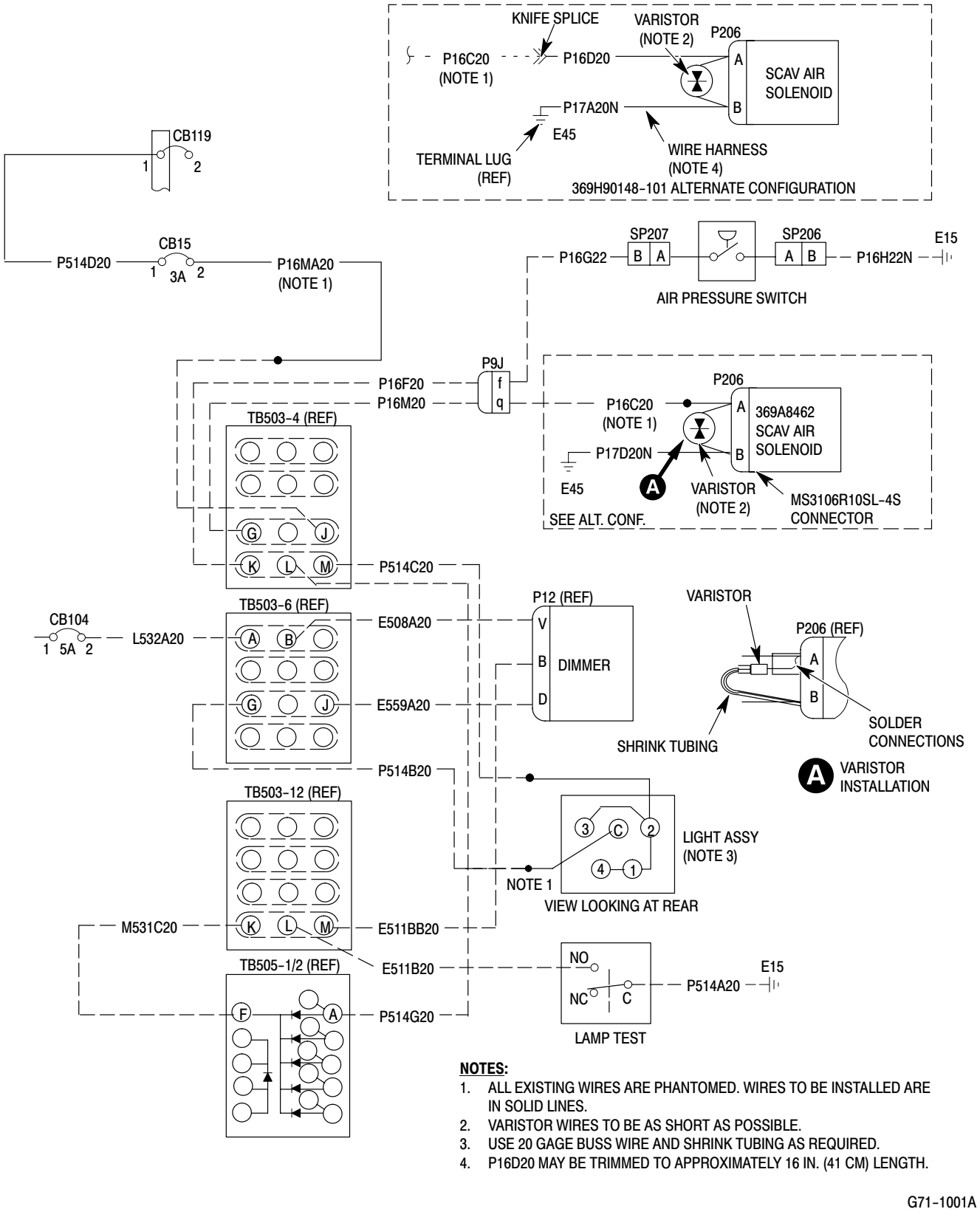


Figure 103. 369H90148–519, –521, –527, –529 Particle Separator Installation Wiring Diagram

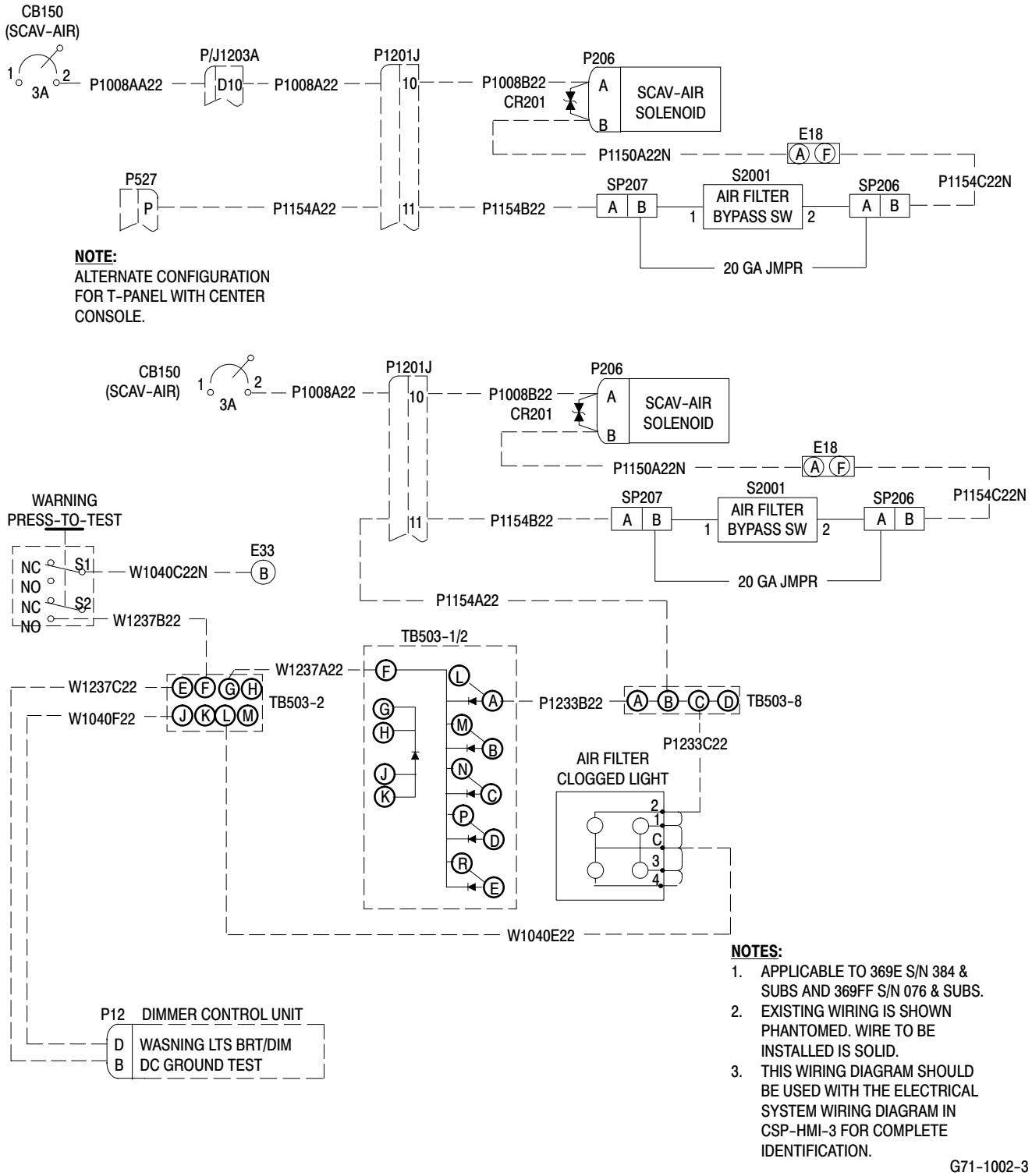


Figure 104. 369H90148–535,–537, –539, –541, –543, –545 and 500N90148–1, –3 Particle Separator Installation Wiring Diagram

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from duct indicates that solenoid air valve has opened.

(5). Switch SCAV AIR circuit breaker OFF.

(6). Check that no scavenge air flows from outlet duct.

(7). Shut down engine per Pilot's Flight Manual.

5. Air Pressure Sensing Switch Calibration Check

(1). Assemble test equipment (Ref. Figure 601).

(2). Attach pressure switch to test equipment. Connect a suitable vacuum source to pressure switch nipple and u-tube.

(3). Connect an ohmmeter or continuity tester to pressure switch electrical leads.

(4). Cycle switch from open to close several times with vacuum. Watch meter for indication of switch closure. Release vacuum.

(5). Slowly apply vacuum. Note u-tube water height differential in both legs of the tube relative to the switch closing point. The total of the differential heights of both legs of the u-tube is equal to switch actuation pressure.

(6). Switch closing pressures shall be per the applicable particle separator installation dash number shown (Ref. Figure 601).

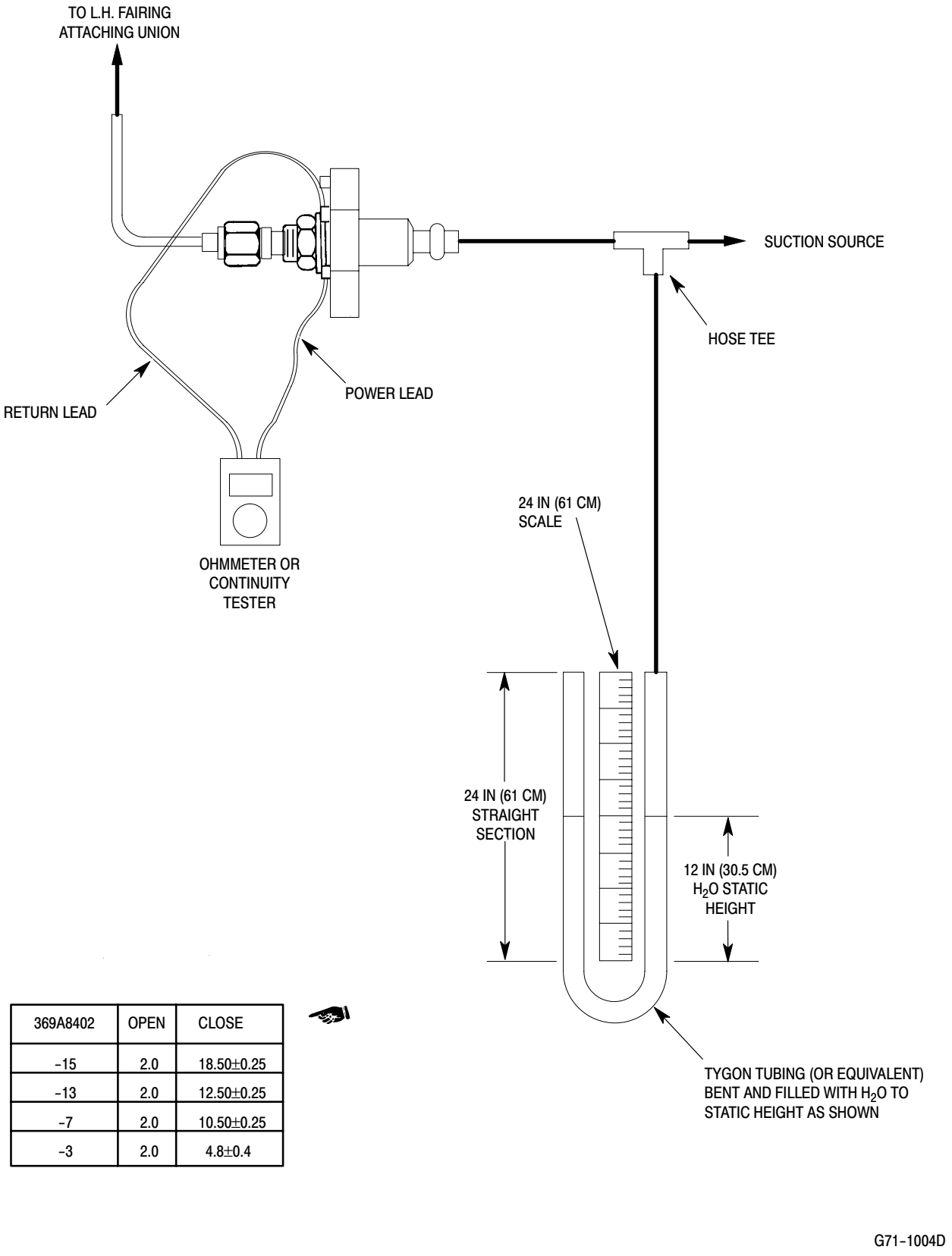
6. Mist Eliminator Inspection

(1). Check mist eliminator serial number for APM serial numbers 005 thru 069. Remove the wire staples from a mist eliminator so identified.

(2). Inspect frame and screens for security and condition. Replace mist eliminator if screens are partially detached, or assembly distortion prevents joint seal contact with the particle separator.

(3). Inspect all nine bolts, where installed, for security in mist eliminator frame. Repair or replace bolts as required (Ref. Page 803).

(4). Examine outlet side of mist eliminator. Surface should be slightly oily but clean. Dirt on the outlet side signals the need to clean the assembly.



369A8402	OPEN	CLOSE
-15	2.0	18.50±0.25
-13	2.0	12.50±0.25
-7	2.0	10.50±0.25
-3	2.0	4.8±0.4

Figure 601. Air Pressure Sensing Switch Calibration Check

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(2). Loosen potentiometer mounting screws and remove drive belt.

(3). Remove screws and washers and remove potentiometer assembly from mounting bracket.

D. Directional Potentiometer Installation

Special Tools (Ref. Section 91–00–00)	
Item	Nomenclature
ST1010	Volt-ohmmeter
N/A	Laptop computer with MT35 program

(1). Prepare potentiometer mounting surfaces for electrical bonding (Ref. CSP-HMI-3, Chap. 96).

(2). Install potentiometer with screws and washers. Torque screws to **20 - 25 inch-pounds (2.25 - 2.82 Nm)**.

(3). Rig potentiometer to directional controls.

(a). Place directional control pedals to full left pedal position and connect ohmmeter (ST1010) between pins 2 and 3. Turn potentiometer gear until resistance is between 1000 and 1250 ohms.
or
Attach electrical connector to potentiometer. Connect MT35 to the ECU and apply power to aircraft. Reading on MT35 should be 0.0% – 7.1%.

CAUTION Excessive tension on drive belt may damage potentiometer.

(b). Install drive belt over both pulleys with teeth fully engaged. Tension belt with potentiometer mounting screws so that the belt does not noticeably sag over the span. Retorque screws to **20 - 25 inch-pounds (2.25 - 2.82 Nm)**.

(c). Place directional control pedals to full right pedal position and verify that potentiometer resistance is between 4500 and 4675 ohms.
or
With electrical connector attached to potentiometer and MT35 connected apply power to aircraft, reading should be 98.6% – 105.0%.

(d). If necessary, belt may be adjusted one tooth on either pulley (one tooth equals 400 ohms).

(e). If more adjustment is required, loosen pedal pulley bolt and rotate pulley to obtain desired resistance. Retorque bolt to **20 - 25 inch-pounds (2.25 - 2.82 Nm)**.

(4). If not already connected, attach electrical connector to potentiometer.

6. CIT (Compressor Inlet Temperature) Sensor Replacement

(Ref. Figure 202)

A. CIT Sensor Removal

(1). Detach electrical connector from CIT sensor.

(2). Remove bolts, washers and CIT sensor.

B. CIT Sensor Installation

(1). Install CIT sensor with bolts and washers. Torque bolts to **36 - 46 inch pounds (4.06 - 5.19 Nm)**.

(2). Attach electrical connector to CIT sensor.

7. Engine Control Box Replacement

A. Engine Control Box Removal

(1). Disconnect engine control cable nut from engine control box and remove cable end from control box coupling.

(2). Remove bolts, washers and engine control box from the engine hydromechanical control unit.

B. Engine Control Box Installation

(1). Install engine control box on the engine hydromechanical control unit with bolt and washer. Torque bolts to **36 - 46 inch pounds (4.06 - 5.19 Nm)**.

(2). Install control cable end into engine control box coupling and connect cable nut. Torque nut to **50 inch pounds (5.64 Nm)**.

(3). Rig engine control cable (Ref. Section 76-00-00).

8. Engine Control Cable Replacement

(Ref. Figure 202)

A. Engine Control Cable Removal

(1). Disconnect control cable nut from engine control box and remove cable end from control box coupling.

(2). Remove screw, washers, spacer, clamp and nut from control cable in engine compartment.

(3). Remove cotter pin, nut, bolt and washers and disconnect control cable from engine throttle bellcrank.

(4). Remove screws, nuts and washers attaching control cable bulkhead swivel to bracket.

(5). Pull engine control cable forward through bracket and control cable conduit and remove from cockpit.

(6). After cable is removed helicopter, refer to Engine Control Cable Shipping and Handling.

B. Engine Control Cable Installation

(1). Before installing a new cable;

(a). Lay the cable straight.

(b). Grasp one end and shake.

(c). This procedure aligns races and removes any twisting.

(2). Push engine control cable through control cable conduit from cockpit aft into engine compartment.

(3). Install control cable bulkhead swivel in bracket with screws, washers and nuts. Torque nuts to **12 - 15 inch pounds (1.35 - 1.69 Nm)**.

NOTE: When installing a 600N7714-3 throttle cable, the 600N7718-1 control cable bracket must be installed for proper control cable alignment.

(4). Connect engine control cable to engine throttle bellcrank with bolt, washers, nut and cotter pin. Torque nut to **30 - 40 inch pounds (3.38 - 4.51 Nm)**.

NOTE: Ensure there are no sharp bends in cable when clamping into position.

(5). Install clamp, screw, washers, spacer and nut attaching control cable to bracket in engine compartment. Torque nut to **12 - 15 inch pounds (1.35 - 1.69 Nm)**.

(6). Run cable through full range of travel to ensure smooth operation.

CAUTION Do not lubricate cable if cable action is not smooth. Lubricant attracts dirt which will damage the cable.

(7). Install control cable end into engine control box coupling and connect cable nut. Torque nut to **50 inch pounds (5.64 Nm)**.

(8). Rig engine control cable.

9. Engine Throttle Control Cable Mounting Bracket Replacement

(Ref. Figure 202)

A. Engine Throttle Control Cable Mounting Bracket Removal

(1). Disconnect throttle cable at collective stick (Ref. Engine Control Cable Replacement).

(2). Disconnect throttle cable from bracket (Ref. Engine Control Cable Replacement).

(3). Remove two nuts, four washers, two spacers and two bolts securing bracket to socket assembly.

(4). Slide bracket over end of throttle cable.

B. Engine Throttle Control Cable Mounting Bracket Installation

(1). Slide bracket over end of throttle cable and align with bolts holes in socket assembly.

(2). Install bolts with washers through bracket and socket assembly.

(3). Install spacers, washers and nuts on bolts (spacers are installed before washers).

(4). Torque nuts to **12 - 15 inch-pounds (1.36 - 1.69 Nm) plus drag torque**.

(5). Connect throttle cable (Ref. Engine Control Cable Replacement).

10. Engine Control Cable Rigging

(Ref. Figure 203)

(1). Loosen control cable jam nuts at cable bulkhead swivel.

(2). Set lever on engine hydromechanical control unit to idle and insert 0.1535-0.1545 inch (3.8989-3.9243 mm) rig pin (or #23 drill blank) in rig pin hole (ensure that rig pin engages the fuel control gearbox, gear, pointer arm and casting.

(3). Set collective twist grip at idle detent position.

(4). Position the cable in the bulkhead swivel so that the cable is not binding and tighten the jam nuts. Torque jam nuts to **40 inch-pounds (4.51 Nm)**.

(5). Remove rig pin (or drill blank).

(6). Rotate the throttle twist grip to full and shutoff positions and verify that the hydromechanical control unit lever contacts the stops at both settings.

(7). Rotate the throttle twist grip from full to idle positions and verify that the pointer on the hydromechanical control unit is between 30-40 degrees.

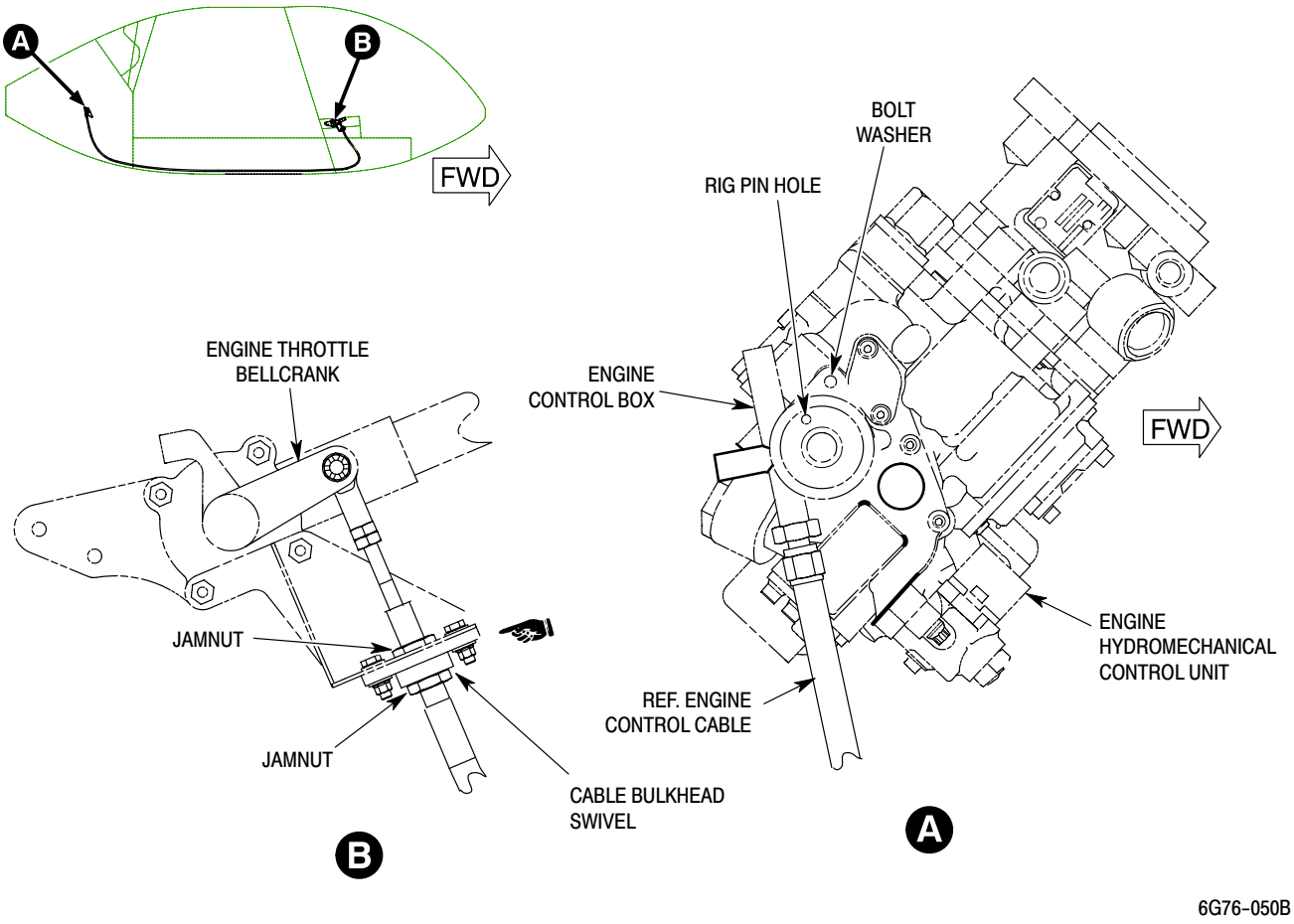

Figure 203. Engine Control Cable Rigging

11. Engine Controls Inspection

(1). Visually inspect ECU for damage and security of installation.

(a). Inspect ECU for security of hardware. Torque or replace loose or missing hardware.

(b). Inspect electrical connectors, wire harnesses and bonding jumper for chafing or cuts. None allowed. Ensure connectors are securely attached.

(2). Visually inspect collective and directional potentiometers for damage and security of installation.

(a). Inspect potentiometers for security of hardware. Torque or replace loose or missing hardware.

(b). Inspect drive belts for cuts and excessive tension. None allowed.

(c). Inspect electrical connectors and wire harnesses for chafing or cuts. None allowed. Ensure connectors are securely attached.

(3). Visually inspect CIT sensor for damage and security of installation.

(a). Inspect CIT sensor for security of hardware. Torque or replace loose or missing hardware.

(b). Inspect electrical connector and wire harness for chafing or cuts. None allowed. Ensure connector is securely attached.

(4). Visually inspect engine control box and control cable for damage and security of installation.

(a). Inspect engine control cable for sharp bends, chafing, binding (smooth operation through full range of travel), corrosion and dents. None allowed.

CAUTION Do not lubricate cable if cable action is not smooth. Lubricant attracts dirt which will damage the cable.

(b). Inspect engine control box and control cable for security of hardware. Torque or replace loose or missing hardware.

(c). Inspect control cable to control box connection for security. Torque control cable nut.

12. Engine Control Cable Shipping and Handling

(Ref. Figure 204) The following procedures should always be used when handling the engine control cable. This cable can be damaged if handled incorrectly.

A. Control Cable Removal From Shipping Box

The control cable is shipped in a “lazy figure 8” configuration.

(1). Lift control cable from box.

(2). Hold the cable upright in both hands.

(3). Remove the shipping wire.

(4). Starting with the nearest end fitting, pay out the loops of the cable, one at a time.

(5). Lay the cable straight.

(6). Grasp one end fitting and shake the cable to align the races.

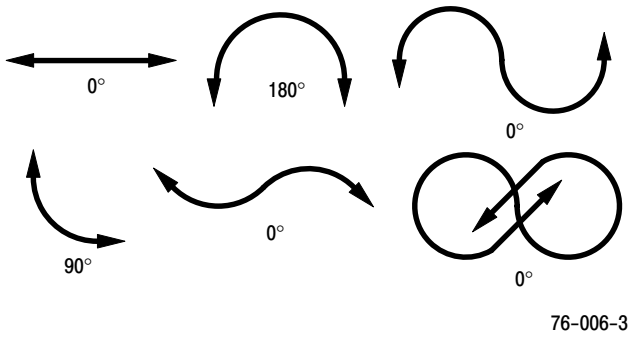

Figure 204. Effective Bend Angle

B. Control Cable Installation into Shipping Box

(Ref. Figure 204) The cable is to be folded into a “lazy figure 8” position whenever it is shipped.

CAUTION Never allow cable to be bent more than 180 degrees effective bend angle, this will damage cable.

NOTE: The following procedure may require more than one person to perform.

(1). Lay cable flat.

(2). Grasp both ends of cable and gently bend in opposite directions.

(3). Continue bending until you have a “figure 8”.

(4). To fit the cable into a shipping box, the cable may have to be bent into a double “figure 8”.

(5). Gently wire the cable together in the center of the “figure 8” to prevent damage in shipping or storage.

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Table 1. Consumable Materials (Cont.)

Item No.	Material	Specification No. (1) Type Class Grade	Commercial Name/No. (2)	Vendor (Table 2)
CM126	Oil, turbine (4) (5)	MIL-L (PRF)-23699		(3)
CM127	Grease, YSAS Actuator		168043	MS90
	Solvents, Cleaners and Corrosion Preventative Compounds			
CM201	Protective coating	MIL-C (PRF)-6799 1		(3)
CM202	Metal protector, aerosol		Molykote	MS22
CM203	Potting compound	MIL-S (PRF)-8516G		MS77
CM204	Compound, corrosion preventative	MIL-C (PRF)-16173E 3 4	Braycote	MS10 MS13 MS88
CM205	Dielectric compound		DC-4	MS22
CM206	Chemical coating	MIL-C-5541	Iridite 14-2 Al-Coat Alodine 1201	MS67 MS85
CM207	Chromic acid solution (pH 2.6 to 3.4, magnesium touchup)		Dow #19 or equivalent	MS22
CM208	Barrier material (grease-proof)	MIL-B (PRF)-121G 1 . . . . . 2 . . . . . A MIL-B (PRF)-131L 1		(3)
CM209	Putty, general purpose	MIL-P (PRF)-8116	Compound 3998	MS32
CM210	Corrosive preventive (aircraft gas turbine, synthetic base)	MIL-C (PRF)-8188		(3)
CM211	Solvent		3339	MS82
CM212	Releasing agent		TC7-527	MS26
CM213	Releasing agent		225	MS64
CM214	Releasing agent	MIL-P (PRF)-23377 HMS 20-1245		MS14 MS17
CM215	Parting agent		Slip-Spray Fre-Kote 33	MS24 MS31
CM216	Loctite remover (for disassembled parts)		Oakite 156	MS17 MS57 MS74
CM217	Isopropyl alcohol	TT-I-735		(3)
CM218	Alcohol, denatured	O-E-760 1		(3)
CM219	Methyl-ethyl-ketone	TT-M-261		(3)
CM220	Naphtha aliphatic	TT-N-95 2		(3)
CM221	Xylene			(3)
CM222	1,1,1-Trichloroethane	O-T-620		(3)
CM223	Acetone	O-A-51		(3)

Table 1. Consumable Materials (Cont.)

Item No.	Material	Specification No. (1) Type Class Grade	Commercial Name/No. (2)	Vendor (Table 2)
CM224	Soap paste	P-S-560		(3)
CM225	Detergent, general purpose	MIL-O-16791		(3)
CM226	Cleaning compound, alkaline waterbase	MIL-C-25769		(3)
CM227	Washing compound with wax			(3)
CM228	Surface cleaner (pre-paint solution with phosphoric acid base)	TT-C-490 MIL-C-10578 2	WO#1	MS79
CM229	Paint remover (acid-type for epoxy)	TT-R-25134		MS79
CM230	Paint remover (solvent-type)	MIL-R-25314		(3)
CM231	Plastic bead, spherical 20 - 30 mesh		Poly Plus 20/30 (8)	MS1 MS2 MS61
CM232	Rust inhibitor spray		WD-40	MS68
CM233	Rust inhibitor spray		LPS3	MS46
CM234	Solvent, dry-cleaning		P-D-680	(3)
CM235	Cleaner		Desoclean 45	MS17
	Paints (9), Primers and Coating Compounds			
CM301	Pre-treatment	MIL-P-15328		(3)
CM302	Epoxy primer / Catalyst reducer		1-1G-69 / 1-1H-75	MS3
CM303	Wash primer	MIL-C-8514		(3)
CM304	Enamel, epoxy (Fed–Std–595)	MDM 15-1100 2	Black #37038 White #37769 Tan #20318 Parchment #20371 Red #11958 Green #34151 Gray #36231 Yellow #13655	(3)
CM305	Lacquer, acrylic (Fed–Std–595)	MDM 15-1083	Black #17038 Black #37038 Parchment #20371 Green #34151 Blue #15102 Blue #35044 Brown #30140	(3)
CM306	Lacquer, clear (aluminum clad alloy surfaces)	MIL-L-6066		(3)
CM307	Lacquer, acrylic semi-gloss	HMS 15-1083		(3)
CM308	Lacquer, blue	FED-STD-15102		(3)
CM309	Lacquer, green	TT-L-32		(3)

Table 3. Special Tools (Cont.)

Item No.	Part No.	Nomenclature	Function	Vendor (Table 4)
		Anti–Torque		
ST601	500N9901–3	Rigging pin	Rigging of NOTAR® anti–torque flight controls.	
ST602	830006–809–00653	Spring tension removal tool	Removal of anti–torque bungee spring & splitter spring.	
ST603	500N9502–1 or ATP1–500N5365–1	Tip seal cutter	Anti–torque tip seal felt metal cutting tool.	
ST604	500N9505–1	Coupling socket	Fan & gearbox coupling socket.	
ST605	500N9506–1	Fan nut socket	Anti–torque fan removal.	
ST606	369D29931 369D29907	T/R swashplate rigging tool (2–bladed tail rotor) (4–bladed tail rotor)	Rig tail rotor controls.	
ST607	369D29823 369D29826	Adapter, torque wrench (2–bladed tail rotor) (4–bladed tail rotor)	Install tail rotor nut.	
ST608	369D29822–3	Pitch control assembly holding block	Secure tail rotor swashplate block to remove/install nut.	
ST609	369D29822–5	Adapter, torque wrench	Remove/install tail rotor swashplate housing bearing nut.	
ST610	369A1600–80902	Bushing wrench	Install and torque tail rotor hub threaded bushing.	
ST611	83006–809–00090 –1	Arbor press fixture, 369A7951–5 bearing	Install tail rotor pitch control link bearings.	
ST612	83006–809–00090 –15	Staking tool, 369A7951–5 bearing	Stake tail rotor pitch control link bearings.	
ST613	269A9232	Plug, bearing removal	Remove tail rotor pitch control housing bearings.	
		Main Rotor		
ST701	369A9829	Main rotor wrench assembly	Loosening/torquing of main rotor mast nut.	
ST702	369D29932 600N9932	Hub puller (369D/E/FF – 500N) (600N)	Separate main rotor hub from mast.	
ST703	369A9933 *369A9933–5	Main rotor hub driver	Seat main rotor hub.	
ST704	369D29957	Adapter, torque wrench	Install main rotor drive shaft fasteners.	
ST705	369A9825	Pitch bearing stud wrench	Remove main rotor hub pitch bearing pivot pin.	
ST706	83006–809–00090 –1	Arbor press fixture (369A7951–5 bearing)	Install main rotor pitch housing bearings.	

Table 3. Special Tools (Cont.)

Item No.	Part No.	Nomenclature	Function	Vendor (Table 4)
ST707	83006-809-00090 -15	Staking tool (369A7951-5 bearing)	Staking main rotor pitch housing bearings.	
ST708	83006-809-00088	Staking tool (pilot and punch) (369A7951-45 bearing)	Install pitch control housing bearings and swage rings.	
ST709	3006-809-00090 -1/-8	Arbor press fixture (369A7951-15 bearing)	Install main rotor blade bearings.	
ST710	3006-809-00090 -15/-20	Staking tool (369A7951-15 bearing)	Stake main rotor blade bearings.	
		Fuel		
ST801	MITYVACR #4000	Hand operated vacuum pump kit	Pump down airframe and engine fuel systems for vacuum leak check.	TS13
ST801-1	AN840-D	Nipple, hose	Vacuum pump adaptive hardware.	
ST801-2	AN910-1D	Coupling		
ST801-3	AN816-4D	Nipple		
ST801-4	AS3084-04	O-ring		
ST802	369A8100-80902	Spanner wrench	Fuel cross-over fitting torquing.	
		Track and Balance		
ST901	369D29942	Tip cap assembly	Tracking main rotor blades.	
ST902	369H9928	Main rotor blade fixture and tab bending tool	Adjusting main rotor blade tab angle/blade track.	
ST903		Balancer/analyzer instrument kit	Track and balance of dynamic components.	TS5
		Electrical / Instruments / Avionics		
ST1001	RXT20-5 (extract) RTM20-9 (insert)	HYTIP insertion/extraction tool.	Install/remove HYTIP electrical contacts in terminal block modules.	TS4
ST1002	M8ND N14HCT2	HYTOOL M8ND and N14HCT	Crimp MINILOK and MODULOK terminal block contact tips on electrical wire.	TS4
ST1003	107-0970	Hand operated crimping tool (with positioners 107-0976 and 107-0977)	Crimp removable contacts in rectangular connectors.	TS18
ST1004	107R1001 107-1015	Contact removal tool / Contact insertion tool	Remove and insert removable contacts in rectangular connectors.	TS18
ST1005	CEIT 20	Insertion/extraction tool (20 Wire Mate connector)	Connect/disconnect No. 20 Wire Mate electrical connectors.	TS8