Manual: CSP–HMI–2, Handbook of Maintenance Instructions
Models: 369D/E/FF – 500/600N Helicopters
Issued: 31 October 1990
Original: **Revision 42:**
1 June 2009

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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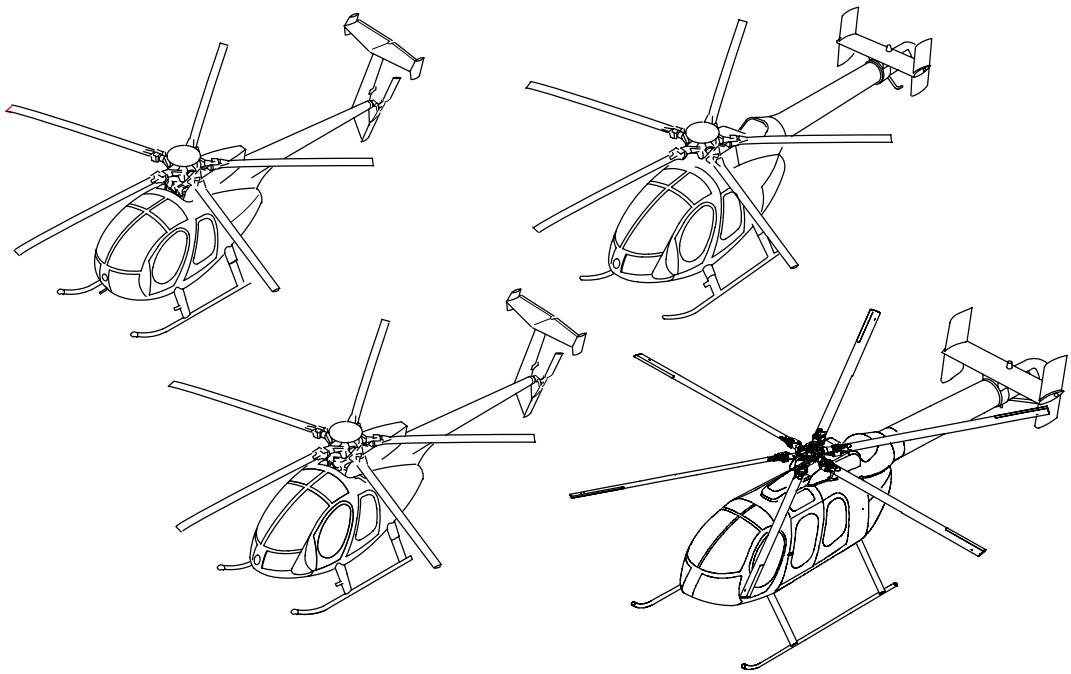
MDHI MODEL HELICOPTERS

MODELS 369D/E/FF – 500/600N

Basic Handbook of Maintenance Instructions

(CSP–HMI–2)

SERVICING AND MAINTENANCE



MD Helicopters, Inc.
4555 East McDowell Road
Mesa, Arizona 85215–9734

Issued: 31 October 1990
Revision No. 42: 1 June 2009

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RECORD OF TEMPORARY REVISIONS

Rev. No.	Date Inserted	By	Date Removed	By	Rev. No.	Date Inserted	By	Date Removed	By
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95–002			Removed by Revision 13		03–003			Removed by Revision 35	

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03–004			Removed by Revision 35						
04–001			Removed by Revision 36						
05–001			Removed by Revision 37						
05–002			Removed by Revision 38						
06–001			Removed by Revision 39						
07–001			Removed by Revision 40						
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08–002			Removed by Revision 42						
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LIST OF EFFECTIVE PAGES

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Date of original and revision pages are:

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Revision 2 . . . . . 10 May 1991
Revision 3 . . . . . 09 September 1991
Revision 4 . . . . . 20 January 1992
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Revision 6 . . . . . 21 December 1992
Revision 7 . . . . . 01 June 1993
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Revision 19 . . . . . 16 December 1997
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Revision 37 . . . . . 13 December 2005
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Table 201. Related Publications and Directives (Cont)

Component and Manufacturer, or Source	Publication Title	Publication or Directive No.
MDHI Publications		
MD Helicopters Inc. M615–G048 4555 E. McDowell Rd. Mesa, AZ 85215–9734 Technical Publications Order Desk: (480) 346–6373 or (800) 388–3378 FAX: (480) 346–6809	369D Pilot's Flight Manual (with applicable Equipment Supplements)	CSP–D–1 (1)
	369E Pilot's Flight Manual (with applicable Equipment Supplements)	CSP–E–1 (1)
	369FF Pilot's Flight Manual (with applicable Equipment Supplements)	CSP–FF–1 (1)
	500N Pilot's Flight Manual (with applicable Equipment Supplements)	CSP–520N–1 (1)
	600N Pilot's Flight Manual (with applicable Equipment Supplements)	CSP–600NRFM–1 (1)
	Illustrated Parts Catalog (IPC), Model 369D/E/F – 500/600N	CSP–IPC–4 (1)
	Basic Handbook of Maintenance Instructions (HMI–2) Servicing and Maintenance, Model 369D/E/F – 500/600N	CSP–HMI–2 (1)
	Basic Handbook of Maintenance Instructions (HMI–3) Instruments–Electrical–Avionics, Model 369D/E/F – 500/600N	CSP–HMI–3 (1)
	Component Overhaul Manual (COM), Model 369D/E/F – 500/600N	CSP–DEF–5 (1)
	Structural Repair Manual (SRM), Model 369D/E/F – 500N	CSP–DEF–6 (1)
	Illustrated Structures Catalog (ISC), Model 369D	CSP–D–7 (1)
	Illustrated Structures Catalog (ISC), Model 369D/E/FF – 500N	CSP–ICS–7 (1)
	Corrosion Control Manual	CSP–A–4
Battery		
Marathon Battery Company Cold Spring, NY 10516 Phone: (817) 776–0650 (formerly Sonotone)	Marathon Battery Instruction Manual	BA–89 (REV 2–71)

Table 201. Related Publications and Directives (Cont)

Component and Manufacturer, or Source	Publication Title	Publication or Directive No.
Engine		
Rolls–Royce Corporation P.O. BOX 420 Indianapolis, IN 46206 USA Phone: 317–230–3774 Fax: 317–230–6084 email: indy.pubs.services@rolls–royce.com	Operation and Maintenance Manual, Turboshaft Engine Model 250–C20, –C20B	10W2 (1)
	Overhaul Manual, Turboshaft Engine Model 250–C20, –C20B	10W3 (1)
	Illustrated Parts Catalog, Turboshaft Engine Model 250–C20, –C20B	10W4 (1)
	Installation Bulletin, Three Cubic Inch Accumulator for 250–C20 Bendix Fuel System	1005 (1)
	Operation and Maintenance Manual, Turboshaft Engine Model 250–C20R/2	GTP–5232–2 (1)
	Overhaul Manual, Turboshaft Engine Model 250–C20R/2	GTP–5232–3 (1)
	Illustrated Parts Catalog, Turboshaft Engine Model 250–C20R/2	GTP–5232–4 (1)
	Operation and Maintenance Manual, Turboshaft Engine Model 250–C30	14W2 (1)
	Overhaul Manual, Turboshaft Engine Model 250–C30	14W3 (1)
	Illustrated Parts Catalog, Turboshaft Engine Model 250–C30	14W4 (1)
	Operation and Maintenance Manual, Turboshaft Engine Model 250–C47M	CSP 21004 (1)
	Overhaul Manual, Turboshaft Engine Model 250–C47M	CSP 22004 (1)
	Illustrated Parts Catalog, Turboshaft Engine Model 250–C47M	CSP 23001 (1)
Starter–Generator		
Aircraft Parts Corporation 160 Finn Court Farmingdale, NY 11735 Phone: (516) 249–3053 Datafax: (516) 249–2577	Brush Seating – APC Brushes in High Speed Starter Generators: MDHI Part Nos. 369A4550 and 369D28550	SB150SG105
	Overhaul Manual With Illustrated Parts Breakdown	TM 101
TRW Aeronautical Systems Lucas Aerospace 30 Van Nostrand Ave. Englewood, NJ 07631–4396 Phone: (201) 541–3250 Datafax: (201) 894–1965	Overhaul Instructions with Parts Breakdown, Models 23032–010, 23032–011, 23032–020, 23032–022, 23032–028, 23081–001	Call or write
Fargo Manufacturing Co. 2750 North Elston Ave. Chicago, Illinois 606447	Starter/Generator Cooling System Supplemental Type Certificate	STC No. SH907GL

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.

REVISION:	DATE	FAA SIGNATURE AND DATE
Original Issue:	October 31, 1990	Not FAA approved
Revision 1:	March 29, 1991	Not FAA approved this revision
Revision 2:	May 10, 1991	6/20/91
TR 91–001	August 12, 1991	8/14/91
Revision 3:	September 9, 1991	9/12/91
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 MANAGER
Revision 10:	September 26, 1994	Section 04–00–00 Not Affected This Revision
TR 94–002	October 24, 1994	10/24/94

REVISION:	DATE	FAA SIGNATURE AND DATE
Revision 11:	January 18, 1995	01/23/95
Revision 12:	October 6, 1995	Section 04–00–00 Not Affected This Revision
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
TR 97–001:	July 2, 1997	07/02/97
TR 97–002:	August 19, 1997	08/19/97
Revision 18:	October 17, 1997	Section 04–00–00 Not Affected This Revision T/R 97–001 and 97–002 Previously Signed
Revision 19:	December 16, 1997	12/19/97
TR 98–001:	March 25, 1998	03/25/98
Revision 20:	June 1, 1998	Section 04–00–00 Not Affected This Revision T/R 98–001 Previously Signed
TR 98–002:	June 22, 1998	7/10/98
TR 98–003:	3 August 1998	8/3/98
Revision 21:	24 August 1998	Section 04–00–00 Not Affected This Revision T/R 98–002 and 98–003 Previously Signed
Revision 22:	10 March 1999	Section 04–00–00 Not Affected This Revision
Revision 23:	1 June 1999	Section 04–00–00 Not Affected This Revision
Revision 24:	7 December 1999	12/30/99
Revision 25:	28 April 2000	Section 04–00–00 Not Affected This Revision
Revision 26:	17 August 2000	8/11/00
Revision 27:	9 October 2000	Section 04–00–00 Not Affected This Revision
Revision 28:	30 November 2000	Section 04–00–00 Not Affected This Revision

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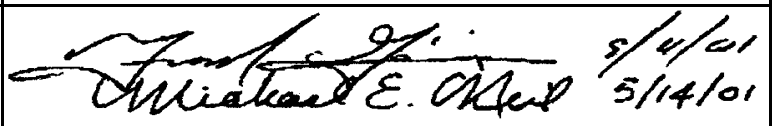
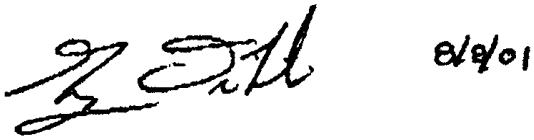
Revision 29:	11 May 2001	 5/4/01 5/14/01
Revision 30:	11 July 2001	Section 04–00–00 Not Affected This Revision
TR 01–001:	10 August 2001	 8/9/01
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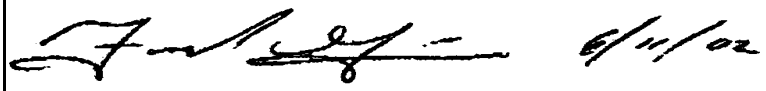
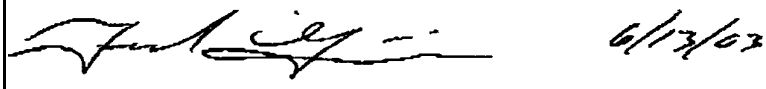
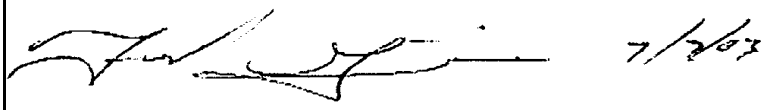
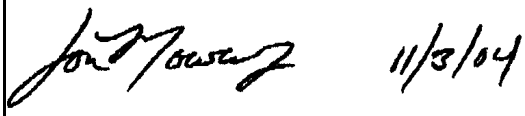
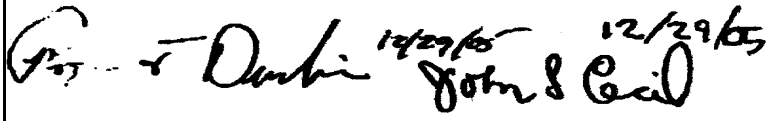
TR 02–002:	30 January 2002	 1/23/02
Revision 32:	18 March 2002	 3/15/02
Revision 33:	24 June 2002	 6/11/02
TR 03–001:	18 June 2003	 6/13/03
TR 03–002:	25 June 2003	 7/3/03
Revision 34:	21 August 2003	Section 04–00–00 Not Affected This Revision T/R 03–001 and 03–002 Previously Signed
TR 03–003:	30 September 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
Revision 37:	13 December 2005	Section 04–00–00 Not Affected This Revision
TR 05–002:	16 December 2005	 12/29/05 12/29/05
Revision 38:	25 April 2006	Section 04–00–00 Not Affected This Revision T/R 05–002 Previously Signed

REVISION:	DATE	FAA SIGNATURE AND DATE
TR 06–001:	05 July 2006	7/17/06
Revision 39:	10 April 2007	Section 04–00–00 Not Affected This Revision
TR 07–001:	11 April 2007	Section 04–00–00 Not Affected This Revision
Revision 41:	03 March 2008	2/29/08
TR 08–001	14 March 2008	3/14/08
TR 08–002	07 November 2008	11/6/08
Revision 42:		Section 04–00–00 Not Affected This Revision T/R 08–001 and 08–002 Previously Signed

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)
		369D21120-505	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)
		369D21121-505	3430 (37)	100 (20)

Table 1. Airworthiness Limitations Schedule (Cont.)

Component (1)	Model	Part Number (2)	Finite Life Hours (1)	Mandatory Inspection Hours
Blade assembly, main rotor	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)
		369D21121–505	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)
		369D21121–505	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	
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)	

Table 1. Airworthiness Limitations Schedule (Cont.)

Component (1)	Model	Part Number (2)	Finite Life Hours (1)	Mandatory Inspection Hours
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	(42)	
	369F/FF	369F5510	(42)	
	500N	369F5510	(42)	
	600N	600N5510	14000 (35)	
Mast assembly, main rotor	369D/E/F/FF 500N	369D22014	10450	
	600N	369D22014	3500	

Table 1. Airworthiness Limitations Schedule (Cont.)

Component (1)	Model	Part Number (2)	Finite Life Hours (1)	Mandatory Inspection Hours
Drive Shafts, Couplings and Clutches				
Drive shaft, main rotor transmission	369D/E/F	369A5510	3790	
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 (3) 369D25351		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) 369D21640–507 (38)	5200 5140 5140 5140 5140 5140 5140 400 5140 5140 5140	
	369F/FF	369D21606 369D21642–501 (38) 369D21642–503 (38) 369D21642–505 (38) 369D21642–507 (38)	5140 400 5140 5140 5140	

Table 1. Airworthiness Limitations Schedule (Cont.)

Component (1)	Model	Part Number (2)	Finite Life Hours (1)	Mandatory Inspection Hours
Blade assembly, tail rotor (optional 4–blade)	369D/E	369D21615	10000	
		369D21641–501 (38)	400	
		369D21641–503 (38)	10000	
		369D21641–505 (38)	10000	
		369D21641–507 (38)	10000	
Hub, tail rotor	369D/E/F/FF	369A1725	3450	
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	
Tension–Torsion Strap, NOTAR®	500N	500N5311–5	(43)(44)	
	600N			
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	
Rotating cone assembly	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	10000	100 (14)
	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)

Table 1. Airworthiness Limitations Schedule (Cont.)

Component (1)	Model	Part Number (2)	Finite Life Hours (1)	Mandatory Inspection Hours
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)	
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)	

Table 1. Airworthiness Limitations Schedule (Cont.)

Component (1)	Model	Part Number (2)	Finite Life Hours (1)	Mandatory Inspection Hours
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.) 281993 (Walter Kidde) 12754–1 (Holex, Inc.) 5003527 (Tavco)	5 years 5 years 5 years 5 years	
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, −507 tail rotor blades are two−way interchangeable with the 369D21613 tail rotor blades in sets of two only.
The 369D21641−501, −503, −505, −507 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, −507 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).

(42) RIN = (29 x Hrs.) + (1 x TE).

(43) The tension−torsion straps have a 5 year calendar life that starts the day the package is opened (Ref. Sect 64−25−30). If the date the package was opened is unknown, the 5 year calendar life is based on the manufacturing cure date.

For straps installed before 06 March 2008 on model 500N helicopters serial numbers LN−001 thru LN−105 and Model 600N helicopters serial numbers RN003 thru RN074, the initial calendar replacement is based on the cure date on the strap. Refer to Table 2 to find the expiration date.

(44) 500N5311−5 straps previously installed on MD900 helicopters are life limited to 2,500 hours when installed on 500N and 600N series helicopters.

Table 2. Tension–Torsion Strap Expiration Date	
Manufacturers Cure Date	**Expiration Date**
Before 03/1999	09/2008
03/1999 thru 02/2001	03/2009
03/2001 thru 02/2005	03/2010
03/2005 thru 02/2008	Cure Date Plus 5 Years

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CONTINUED AIRWORTHINESS CONDITIONAL INSPECTIONS

1. General

This section contains the unscheduled or conditional inspections. You must do the necessary Maintenance Manual specific inspections and procedures shown in Table 1 to make sure there is continued airworthiness of the helicopter.

If there is an incident with your helicopter not shown in this section, record all information regarding the incident and speak to the Field Service Department at MDHI, Mesa, Arizona. Telephone 1-800-388-3378 or (480) 346-6387. DATAFAX: (480) 346-6813 for inspections and maintenance procedures you need to do.

It is possible you will need to do more than one of the inspections or procedures shown in Table 1 of this section. Do all inspections that are applicable.

NOTE: Refer to the applicable Rolls-Royce Engine Operation and Maintenance Manual (Ref. Section 01-00-00, Table 201) for detailed requirements on inspection of the engine for specific or unique conditions comparable to those listed.

WARNING

- **All components, assemblies, or parts that are removed for overhaul or repair must be identified with the cause for removal.**
- **All other components, assemblies, or parts that need to be replaced, must be discarded.**

2. Hard Landing

A hard landing is an incident or accident in which the helicopter hits the ground with sufficient force to cause:

- main rotor blade to hit the tailboom or upper fairings or cowlings.
- permanent deformation of the landing gear more than permitted limits.
- the lower fuselage, lower tailboom surface, tailrotor, or thruster to touch the ground.

Use the schedule of inspections in Table 1, Conditional Inspections, After Hard Landing if you think a hard landing has occurred.

3. Overspeed

Overspeed is an incident in which the rotor speed (N_R) is more than the limits shown in the applicable Rotorcraft Flight Manual. Use the schedule of inspections in Table 1, Conditional Inspections, After Main Rotor Overspeed when an overspeed has occurred.

4. Overtorque

Overtorque is an incident in which the main transmission torque loads are more than the permitted limits. Use the schedule of inspections in Table 1, Conditional Inspections, After Main Transmission Overtorque Beyond Transient Limits when an overtorque has occurred.

5. Sudden Stoppage

Sudden stoppage is a rapid deceleration of the main rotor, rotor drive system, tail rotor, or anti-torque fan.

Sudden stoppage of the main rotor and rotor drive system is caused when the main rotor blades hit the ground, water, snow, thick vegetation, or other object of sufficient mass to cause deceleration. Sudden stoppage of the main rotor and rotor drive system can also occur during a hard landing if the blades hit the fuselage or the tailboom. Use the schedule of inspections in Table 1, Conditional Inspections, After Main Rotor Blade/Drive System Sudden Stoppage when sudden stoppage of the main rotor has occurred.

Sudden stoppage of the tail rotor is caused when the tail rotor blades hit the ground, water, snow, thick vegetation, or other object of sufficient mass to cause deceleration. Use the schedule of inspections in Table 1, Conditional Inspections, After Tail Rotor Blade Strike when sudden stoppage of the tail rotor has occurred.

6. Lightning Strike

When you think there has been a lightening strike on the helicopter, use the schedule of inspections in Table 1, Conditional Inspections, After Lightening Strike inspection procedures.

7. Conditional Inspection Table

- Inspections in this table are for MDHI 369D/E/FF and 500/60N helicopters only. The first column of the table denotes which model helicopter the inspections are applicable to.
- The second column of the table has a short description of the necessary inspection or procedure.
- The third column of the table shows, if applicable, the manual or section that has the specific inspection or procedure.

Table 1. Conditional Inspections

Model	Requirement	Chap/Sect
	AFTER HARD LANDING	
	WARNING: Any component, assembly or detailed part that is removed for overhaul must be identified as to the reason for removal. Components that require replacement must be discarded.	
ALL	Main rotor blades for bending, cracks or wrinkles.	62
ALL	Main rotor blade droop stops for damage.	62
ALL	Main rotor hub assembly and strap pack assembly for evidence of damage.	62
ALL	Accessible areas of main rotor mast assembly and transmission attachment area for damage.	63
ALL	Perform Landing Gear Inspection. Forward and aft rub plates for condition.	32–10–00
ALL	Perform Tailboom Inspection; retorque mount bolts.	53–40–00 53–40–30
ALL	Inspect tailboom attachment area for damage.	53
500/600N	Inspect stationary thruster attachment flange for damage; retorque mount bolts.	53
369D/E/FF	Tail rotor drive shaft and damper, tail rotor transmission and tail rotor for distortion, loose mounting or attaching parts, buckling, breaks or other damage. Tail rotor drive shaft for contact with bulkheads.	63 64
500/600N	Main transmission–to–fan transmission drive shaft, fan transmission, fan drive shaft, fan and fan control rod for distortion, loose mounting or attaching parts, buckling, breaks or other damage. Drive shafts for contact with bulkheads. Fan control rod for freedom of movement.	63 67
ALL	Perform Engine Mounts and Fittings Inspection. Inspect mounting pads and firewall for damage and distortion. Inspect all suspected parts by magnetic particle or dye–penetrant methods, as applicable (Ref. CSP–SRM–6).	71
ALL	All flight and engine control system push–pull tubes, links, bellcranks and bearings for bends, cracks, security and free movement.	67
ALL	Tunnel area A–frame for distortion, buckling or any other damage.	53
ALL	Fuselage fittings for bends and cracks.	53
ALL	Main transmission chip detectors for metal particles. Main transmission mounting flanges for cracks.	63
ALL	Perform Main Transmission Drive Shaft Inspection.	63–10–00
ALL	All engine accessories for cracked flanges, loose bolts and nuts, connections and general condition.	79
ALL	Engine accessory drive housing for cracks.	79
ALL	Engine chip detectors for metal particles.	79
ALL	Engine oil tank, supports, tubing and hoses for leaks, cracks and security.	79
ALL	Fuel cells, supports, tubing and hoses for leaks, cracks and security.	28
ALL	Armor for security of attachment, buckling and distortion.	CSP–014
ALL	Rotor brake installation for security of attachment and disc alignment.	63

Table 1. Conditional Inspections (Cont.)

Model	Requirement	Chap/Sect
	AFTER MAIN ROTOR OVERSPEED	
	WARNING: Any component, assembly or detailed part that is removed for overhaul must be identified as to the reason for removal. Components that require replacement must be scrapped.	
	If overspeed is between 523 and 549 (369D/E) or 508 and 533 (369FF, 500N) rpm, or 106 and 112 percent (600N):	
ALL	Main rotor blades for visible damage and distortion; main rotor blade tip caps for security; all bond lines for evidence of separation; root doublers and attachment fittings for security. Replace any blade with visible bond line separation.	62
	Main rotor blade dampers for security.	
369D/E/FF	Tail rotor blades and hub for visible damage, free movement and security.	64
500/600N	NOTAR fan blades and hub for visible damage, free movement and security.	64
ALL	Main rotor hub and strap pack assembly for evidence of damage.	62
	If overspeed is over 549 (369D/E) or 533 (369FF, 500N) rpm, or 112 percent (600N):	
ALL	Remove main rotor hub assembly for overhaul inspection.	MDHI
ALL	Remove and scrap main rotor blades.	62
500/600N	Inspect anti−torque fan assembly.	64
369D/E/FF	Remove tail rotor hub assembly for overhaul inspection.	64
	AFTER MAIN TRANSMISSION OVERTORQUE BEYOND TRANSIENT LIMITS	
ALL	Main transmission for freedom of movement.	63
ALL	Main transmission chip detectors for metal particles. Re−inspect after 8 hours of operation.	63
	AFTER AIRSPEED 10% BEYOND V^{NE} LIMIT	
	WARNING: Any component, assembly or detailed part that is removed for overhaul must be identified as to the reason for removal. Components that require replacement must be scrapped.	
ALL	Main rotor blades for visible damage and distortion; main rotor blade tip caps for security; all bond lines for evidence of separation; root doublers and attachment fittings for security. Replace any blade with visible bond line separation.	62
	Main rotor hub assembly and strap pack assembly for evidence of damage.	
	Main rotor blade dampers for security.	
369D/E/FF	Tail rotor blades and hub for visible damage, freedom of movement and security.	64
369D/E/FF	Horizontal stabilizer for skin damage and loose rivets.	53
	Tip plates and vertical stabilizer for damage to leading and trailing edges and damaged stressed side panels (no repair of side panels permitted).	
	Mounting fittings for cracks and security.	
	Retorque stabilizer attach bolts.	
500/600N	Horizontal stabilizer for skin damage and loose rivets.	53
	600N − Damage to gurney flap.	
	Vertical stabilizers for damage to leading and trailing edges and damaged side panels. Mounting fittings for cracks and security.	
	Retorque stabilizer attach bolts.	

Table 1. Conditional Inspections (Cont.)

Model	Requirement	Chap/Sect
ALL	Tailboom for visible deformation, loose or missing rivets, cracks and security; attaching points to fuselage for cracks and security.	53
ALL	Canopy glass for security	53
	AFTER MAIN ROTOR BLADE/DRIVE SYSTEM SUDDEN STOPPAGE	
	WARNING: Any component, assembly or detailed part that is removed for overhaul must be identified as to the reason for removal. Components that require replacement must be scrapped.	
	Sudden stoppage of the main rotor and rotor drive system is any rapid deceleration of the main rotor drive system. This may be caused by contact of one or more of the main rotor blades with the ground, water, snow, dense vegetation or any other object of sufficient mass to cause deceleration or impact damage to the main rotor blades.	
	A main rotor blade strike in which one or more of the main rotor blades exceed the repair limits in the maintenance manual is defined as sudden stoppage.	
	Sudden stoppage of the main rotor may also occur simultaneously with hard landing in which the blades contact the upper fuselage structure or the tailboom.	
	The inspection requirements, After Main Rotor Drive System Sudden Stoppage – Level 1, is to be used when sudden stoppage of the main rotor drive system has occurred.	
	After Main Rotor Drive System Sudden Stoppage – Level 1	
ALL	Perform inspection of main rotor blades. Pay particular attention to the upper and lower root fittings and attach lug areas. If inspection determines that one or more blades have separation of the trailing edge bond, due to leading edge impact, the blade is bent or shows evidence of a significant impact, and the damage occurred with the engine running, perform the additional inspection in After Main Rotor Drive System Sudden Stoppage – Level 2.	62
ALL	Perform inspection of the main rotor hub and lead–lag link attach lugs. If the lead–lag lug is broken or the pitch housing striker strip shows evidence of contact with the main rotor hub and damage occurred the the engine running, perform the additional inspection in After Main Rotor Drive System Sudden Stoppage – Level 2.	62
ALL	Perform Main Rotor Strap Pack Lamination Inspection.	62–20–00 62–20–60
ALL	Perform Main Rotor Blade and Damper Attach Pin Disassembly and Special Inspection. If a pin is found cracked or bent and damage occurred with the engine running, perform the additional inspection in After Main Rotor Drive System Sudden Stoppage – Level 2.	62–10–00
ALL	Perform Main rotor Damper and Attachments Inspection. If damage to a damper is suspected, perform Main Rotor Damper Weight Loading and Extension Check.	62–20–00 62–20–60
ALL	Perform Main Rotor Drive Shaft Inspection. If main rotor drive shaft is rejected for broken shaft splines, straightness or sheared shaft, perform the additional inspection in After Main Rotor Drive System Sudden Stoppage – Level 2.	63–10–00
ALL	Inspect overrunning clutch sprag assembly (Ref. Detailed Inspection after Cleaning).	COM
	CAUTION: Kamatic couplings are a balanced unit and cannot be disassembled.	
ALL	Perform a visual inspection of all power train drive shafts and couplings for distortion, breaks, cracks, contact with bulkheads and other damage.	63
ALL	Perform a visual inspection of the oil cooler blower assembly.	63

Table 1. Conditional Inspections (Cont.)

Model	Requirement	Chap/Sect
ALL	Check main rotor transmission for freedom of movement. Visually check main rotor transmission mounting flanges for cracks. Inspect main rotor transmission chip detectors for metal accumulation. Reinspect chip detectors after eight hours of helicopter operation.	63
ALL	Perform visual inspection of main rotor flight controls.	67
ALL	Perform visual inspection of the anti–torque system.	64
ALL	Perform visual inspection of engine mounts for security, cracks or misalignment.	71
ALL	Perform visual inspection of the engine control linkage for bends, breaks and proper alignment.	76
ALL	Inspect engine per the special inspection requirements in the appropriate Allison Operation and Maintenance Manual.	01
After Main Rotor Drive System Sudden Stoppage – Level 2		
WARNING: Any component, assembly or detailed part that is removed for overhaul must be identified as being removed due to Main Rotor Sudden Stoppage – Level 2. Components that require replacement must be scrapped.		
ALL	Overhaul main rotor hub.	62
ALL	Remove and scrap main rotor drive shaft.	63
ALL	Overhaul main transmission assembly (Ref. COM).	63
ALL	Remove and scrap engine–to–transmission drive shaft.	63
ALL	Overhaul overrunning clutch assembly (Ref. COM).	63
AFTER TAIL ROTOR BLADE STRIKE		
WARNING: Any component, assembly or detailed part that is removed for overhaul must be identified as to the reason for removal. Components that require replacement must be scrapped.		
After tail rotor blade strike, inspect the following:		
369D/E/FF	If equipped with Bendix couplings, remove and scrap couplings.	63
369D/E/FF	Tail rotor blades for dents, nicks, scratches or separation of skin.	64
369D/E/FF	Tail rotor flapping hinge bolt for damage.	64
369D/E/FF	Tail rotor transmission for radial play and run–out of output shaft, cracks in mounting flanges, and chip detector for metal particles. Remove for overhaul tail rotor transmission if damage is indicated.	63
369D/E/FF	If equipped with Kamatics couplings: Perform Tail Rotor Drive Shaft Twist Inspection. Misaligned or missing stripes require removal and scrapping of drive shaft and Kamatics couplings, and an overhaul inspection of tail rotor transmission (Ref. COM).	63–15–10 63–25–10 63–25–20
369D/E/FF	Remove tail rotor drive shaft and inspect couplings for distortion and cracks; damper, damper bracket and bulkheads for damage.	63
NOTE: If damage in excess of allowable limits due to blade strike is noted in above areas, continue with following inspections:		
369D/E/FF	Tail rotor drive fork, pitch links, swashplate, hub and pitch control bearing housing for obvious damage.	64

Table 1. Conditional Inspections (Cont.)

Model	Requirement	Chap/Sect
369D/E/FF	Upper fuselage and boom tail rotor control linkage. If tail rotor control rod is damaged, ensure that all rod bulkhead grommets are in place.	67
369D/E/FF	Aft frame of tailboom for cracks and boom skin for loosened or popped rivets.	53
369D/E/FF	Main transmission chip detectors and transmission lube pump oil filter for metal particles.	63
369D/E/FF	Main rotor hub assembly and strap pack assembly for evidence of damage.	62
AFTER TAILBOOM STRIKE		
WARNING: Any component, assembly or detailed part that is removed for overhaul must be identified as to the reason for removal. Components that require replacement must be scrapped.		
If one or more main rotor blades strike tailboom while blades are rotating, inspect following:		
ALL	Perform Main Rotor Blade Inspection.	62–10–00
ALL	If excessive damage requires replacement of main rotor blade(s), inspect complete main rotor and scissors assembly, including droop stop mechanism and strap packs, for evidence of damage.	62
369D/E/FF	Remove and inspect tail rotor drive shaft for impact damage, buckling or twisting; couplings for cracks and distortion; damper, damper bracket and bulkheads for damage.	63
369D/E/FF	If excessive damage requires replacement of tail rotor drive shaft, replace couplings and perform overhaul inspection of tail rotor transmission (Ref. COM).	63
CAUTION: Any tailboom damage is significant (Ref. CSP–SRM–6).		
ALL	Perform Tailboom Inspection. Dye–check or remove and scrap tailboom attach bolts.	53–40–00 53–40–30
ALL	Structure forward of tailboom attachment for evidence of sheet metal yielding or buckling. Pay particular attention for signs of buckling at right side forward of tailboom attachment (Ref. CSP–SRM–6).	53
ALL	Perform Upper Fuselage and Tailboom Control Linkage Inspection.	67
ALL	Perform Horizontal Stabilizer Inspection. Perform Vertical Stabilizer Inspection. Retorque stabilizer attach bolts.	53–50–10 53–50–30
369D/E/FF	Tail rotor assembly.	64
369D/E/FF	Tail rotor transmission for radial play and run–out of output shaft; cracks in mounted flanges and chip detector for metal particles.	64
ALL	Main rotor brake, if installed, for condition and alignment of brake disc, calipers and security of attachment.	63
If tailboom strike occurred during POWER ON condition, also inspect the following:		
ALL	Remove and inspect main rotor drive shaft, main transmission drive shaft and couplings for distortion, breaks, cracks and other damage.	63
ALL	Main transmission chip detectors and transmission lube system oil filter for metal particles. Re–inspect chip detectors and oil filter after 8 hours of engine operation. Visually check transmission mounting flanges for cracks.	63

Table 1. Conditional Inspections (Cont.)

Model	Requirement	Chap/Sect
ALL	Engine air inlet and plenum chamber for foreign objects; motor engine and check for unusual noise.	71 76
	Engine mounts for security, cracks or distortion.	
	Engine control linkage for bends, breaks and proper operation.	
500/600N	Inspect stationary thruster attachment flange for damage; retorque mount bolts.	53
ALL	Inspect tailboom attachment area for damage; retorque mount bolts.	53
	AFTER CHIP DETECTOR LIGHT COMES ON	
ALL	Remove chip detector leads, in turn, to determine which chip detector caused indicator to light.	63 71
	Remove and inspect applicable chip detector for metal accumulation.	
ALL	If an engine chip detector caused indicator to light, refer to applicable Allison Engine Operation and Maintenance Manual.	01
ALL	If main transmission chip detector caused indicator to light, perform Main Transmission Filter Replacement.	63–21–00
ALL	If chips measure no longer than 0.125 inch (3.175 mm), drain and refill main and/or fan transmission with new oil. Recheck applicable chip detectors after 4 hours of flight.	12
	AFTER ENGINE CHANGE BECAUSE OF INTERNAL ENGINE FAILURE	
	NOTE: Oil coolers are NOT cleanable and must be scrapped if an engine failure produces metal and NO scavenge oil filter is installed or if a scavenge oil filter is installed and indicates a by–pass has occurred.	
ALL	Remove, flush and reinstall oil tank.	12
	Flush all lines, fittings and associated components.	79
	Remove and reverse flush or replace engine oil cooler.	
	CAUTION: Failure to bleed fuel system can result in unexpected engine flameout or power loss.	
ALL	Bleed fuel system.	28
ALL	Remove and install new scavenge oil filter element (if installed).	79
	AFTER ENGINE FLAMEOUT CAUSED BY FUEL EXHAUSTION	
ALL	Bleed fuel system to remove any entrapped air.	28
	AFTER ENGINE SHUTDOWN USING EMERGENCY FUEL SHUTOFF VALVE	
ALL	Bleed fuel system to remove any entrapped air.	28
	AFTER MAIN TRANSMISSION CHANGE BECAUSE OF INTERNAL TRANSMISSION FAILURE	
ALL	Reverse flush or replace transmission oil cooler, all lines, fittings and associated components.	63
	AFTER FUEL FILTER CAUTION LIGHT COMES ON	
ALL	Check **FUEL FILTER** caution light and circuit for discrepancies.	95
ALL	Perform Fuel Filter (Bypass) Caution Light Pressure Switch Test.	28–00–00

Table 1. Conditional Inspections (Cont.)

Model	Requirement	Chap/Sect
ALL	Remove and install new engine–driven fuel pump filter.	01
	Remove and clean gas producer fuel control filter.	
	Clean and flush all lines and fittings.	
	Check bypass valve per applicable Allison Engine Operation and Maintenance Manual.	
369D/E 500N	Inspect start pump inlet screen for contamination when large amounts of foreign material are found in the engine driven fuel pump filter (or optional airframe fuel filter, if installed).	28
ALL	Perform Fuel Cell Inspection.	28–00–00
	AFTER NEW OR REPLACEMENT MAIN ROTOR HUB IS INSTALLED	
ALL	Perform Main Rotor Hub Droop Angle Check.	62–20–00
	BEFORE INSTALLATION OF NEW BATTERY	
ALL	Perform Battery Charging – Deep Cycling Procedure. Repeat deep cycling procedure once to ensure complete stabilization of battery.	96–05–00
	AFTER MAIN TRANSMISSION DRIVE SHAFT IS REMOVED (ENGINE INSTALLED)	
ALL	Check overrunning clutch for correct oil level.	12
	AFTER COOLER BLOWER IS REMOVED	
ALL	Perform Cooling Blower Inspection (Disassembled). Check belt tension and clearance after installation.	63
	WHEN MAIN ROTOR DRIVE SHAFT IS REMOVED	
ALL	Perform Main Rotor Drive Shaft Inspection.	63–10–00
	AFTER LIGHTNING STRIKE	
	WARNING: Any component, assembly or detailed part that is removed for overhaul must be identified as to the reason for removal. Components that require replacement must be scrapped.	
	If lightning strike is evident on helicopter exterior:	
ALL	Inspect the fuselage interior and exterior, landing gear, rotor systems and ground wire connection for burn marks, cracks, pitting or other signs of high temperature stress, to determine the lightning entry and exit points.	25 32 53
ALL	Trace the path of the lightning strike to the extent possible using a magnetometer.	
ALL	Check the magnetic compass for accuracy (the degree of inaccuracy may serve as an indicator of the severity of the strike).	95
ALL	Inspect all wiring.	96
ALL	Inspect antenna(s) for burns and pitting.	97
ALL	Inspect all electrically operated components and lighting systems for damage.	96
ALL	Inspect communications and navigation equipment for damage.	97
ALL	If the preceding inspections reveal major damage has occurred, proceed as follows: Bench test all avionics and electrical system and components. Perform a continuity check on all wiring and cables. Perform a Voltage Standing Wave Ratio (VSWR) check on all antennas, antenna cables and connectors.	96 97

Table 1. Conditional Inspections (Cont.)

Model	Requirement	Chap/Sect
ALL	Perform specific inspection/replacements as required.	
500/600N	Check fan transmission and interconnecting drive shafts for magnetism and/or burns.	63
500/600N	If previous drive train items show magnetism, overhaul fan transmission.	COM
500/600N	Inspect anti–torque fan and components for evidence of arcing and magnetism; replace any part showing evidence of arcing or magnetism.	64
500/600N	Inspect bellcrank and control rod for any indications of arcing. Scrap parts with indications of arcing.	67
500/600N	Inspect thruster cables, bellcranks and control tubes for any indications of arcing. Scrap parts with indications of arcing.	67
500/600N	Inspect thruster rollers for any indications of arcing. Scrap parts with indications of arcing.	53
ALL	Check oil cooler blower assembly and overrunning clutch for residual magnetism; replace as necessary.	
ALL	Inspect oil cooler assembly for damage; replace as necessary.	
ALL	If previous drive train items show magnetism, overhaul transmission.	
ALL	If overrunning clutch assembly shows magnetism, remove engine and overrunning clutch and overhaul.	
ALL	Perform a ground run operational check on the aircraft. Functionally check the flight control system, and all avionics, electrical, lighting, communication, and navigation systems.	67 96 97
ALL	Repair any damage and replace damaged components as required.	
If lightning strike is evident on main rotor system:		
ALL	Inspect blades for damage such as burns, pitting, skin separation, etc. If damage is evident, scrap damaged blade(s).	62
ALL	Remove hub assembly and return for overhaul.	62
ALL	Inspect all bearings in the fixed and rotating control system located on the main rotor mast.	62
ALL	Remove transmission assembly and overhaul.	63
ALL	Inspect main rotor mast and drive shaft for evidence of burns.	63
ALL	Check drive shafts for residual magnetism. If magnetized or damaged, scrap drive shafts and remove engine for overhaul.	63 71
If lightning strike is evident on tail rotor system:		
369D/E/FF	Inspect blades for damage such as burns, pitting, skin separation, etc. If damage is evident, scrap damaged blade(s).	64
369D/E/FF	Overhaul tail rotor assembly.	COM
369D/E/FF	Scrap pitch change links and pitch change assembly.	64
369D/E/FF	Inspect bellcrank and control rod for any indications of arcing. Scrap parts with indications of arcing.	67
369D/E/FF	Overhaul tail rotor gearbox.	COM
369D/E/FF	Inspect tail rotor drive shaft and drive shaft damper for magnetism and/or burns.	63

Table 1. Conditional Inspections (Cont.)

Model	Requirement	Chap/Sect
369D/E/FF	Check oil cooler blower assembly, overrunning clutch and tail rotor drive shaft couplings for residual magnetism; replace as necessary.	63
369D/E/FF	Inspect oil cooler assembly for damage; replace as necessary.	63
369D/E/FF	If previous drive train items show magnetism, overhaul transmission.	COM
369D/E/FF	If overrunning clutch assembly shows magnetism, remove engine and overrunning clutch and overhaul.	71 COM
369D/E/FF	Inspect engine mounts and fitting for damage. Replace as necessary.	71
AFTER 369F5100 MAIN TRANSMISSION LUBRICATION PUMP IMPENDING BYPASS INDICATOR POPS		
ALL	Refer to Troubleshooting Power Train System	63–00–00
WHENEVER ENGINE IS REMOVED		
ALL	Remove fire blanket from above engine and inspect airframe above engine for evidence of cracks.	53

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STABILIZER
MAINTENANCE PRACTICES

1. Stabilizers Description

The tail surfaces consist of two verticals and a horizontal stabilizer. The tail surfaces (empennage) stabilize the helicopter and maintain it in a relatively contain level attitude and heading during autorotation and forward flight.

A. Horizontal Stabilizer Description

The horizontal stabilizer is constructed of laminated fiber glass composite ribs and skin, bonded to a formed graphite composite spar. The horizontal stabilizer includes a non-structural leading and trailing edges. hollow core spar, sparbox fittings, access panels, torque tubes, bellcranks and control rods.

On the 500N and optional on the 600N, a stability augmentation system (S.A.S.) is attached to the right-hand vertical stabilizer, the early 600N does not have a S.A.S system.

The horizontal stabilizer mounts atop the tailboom. Four eye bolts from the horizontal attach to clevis attachment points on the tailboom. Access plates are attached to the ends caps of the horizontal stabilizer and at center line for access to the control rods, S.A.S. and bellcranks. Two control rods, S.A.S. and bellcranks are routed in the center aft of the sparbox. The angle of incidence of the horizontal stabilizer is preset at -2°. An anti-collision light is mounted in the top center of the stabilizer. Position lighting provisions are provided on both ends of the stabilizers.

On the 600N without S.A.S., gurney flaps were added to the trailing edge of the horizontal for the purpose of increasing lift without increasing the stabilizer area or weight.

Refer to Section 96-40-00 for information on exterior lights and Section 67-20-30 for rigging requirements.

B. Vertical Stabilizers Description

The vertical stabilizers (upper and lower) are constructed of laminated fiber glass composite ribs and skin, bonded to a formed fiberglass composite spar. The vertical stabilizers include a hollow core spar, retainer fittings and nonstructural leading and trailing edges.

The differences on the 600N are that the vertical stabilizers are slightly longer, the skin is thicker and on standard 600N helicopters, are both controlled by the directional control pedals. The lower vertical stabilizer angle of attack is eight degrees clockwise relative to the upper vertical stabilizer. Refer to Section 67-20-30 for flight controls linkage details.

The left vertical stabilizer is mounted to the horizontal on a torque tube fitting assembly and has approximately 6.5 inches (16.51 cm) of travel.

On the 500N and S.A.S. equipped 600N, the right vertical stabilizer, also mounted on a torque tube, is controlled by the stability augmentation system. From the fully extended to the fully retracted position on the S.A.S. actuator, the tip of the right vertical stabilizer trailing edge will travel a minimum of 2.70 inches (6.86 cm). The amount of travel is determine by the S.A.S. computer and gyro.

NOTE: The anti-torque control system must be re-rigged immediately after removal or replacement of control rods, linkages, and components or if helicopter operation reveals a rigging deficiency.

2. Vertical Stabilizer Replacement

(Ref. Figure 201, Figure 202)

A. Vertical Upper and Lower Stabilizer Removal

(1). Remove nuts, washers, and bolts. Remove by lifting vertical stabilizer off torque tube.

B. Vertical Upper and Lower Stabilizer Installation

(1). Installation with Standard Hardware:

CAUTION Do not over-torque nut. Over-torquing nut can crack vertical stabilizer fitting.

(a). Install stabilizer onto torque tube fittings.

(b). Install bolts, washers and nuts. Torque to **30 - 40 inch-pounds (3.39 - 4.52 Nm) plus drag torque**.

(2). Installation with Expandable Bolts:

CAUTION Do not over-torque nut. Over-torquing nut can crack vertical stabilizer fitting.

(a). Install bolt with washer under bolt head and thick washer under nut.

NOTE:

- Do not remove any expanding elements from bolt.
- If 600N2012-5 spacers are not present, up to two spacers may be added to achieve proper installation.

(b). Remove one (1) or two (2) 600N2012-5 spacers, as required) to obtain 0.005-0.035 inch (0.127-0.889 mm) gap between the washers and the vertical stabilizer, equal on each side.

(c). Install nut and note drag torque.

(d). Perform a break in cycle by torquing the nut to **20 - 25 inch-pounds (2.26 - 2.82 Nm)** plus drag torque.

(e). Back off nut until bolt moves freely in hole.

(f). Torque nut to **20 inch-pounds (2.26 Nm)** plus drag torque.

(g). Check for equal gap of 0.005-0.035 inch (0.127-0.889 mm) between the washers and the vertical stabilizer.

NOTE: NAS1149C0332R or NAS1149C0363R washers may be added under the nut for adequate cotter pin engagement.

(h). If necessary, tighten nut until cotter pin hole aligns with castillation in nut.

(i). Install cotter pin.

3. Horizontal Stabilizer Replacement

(Ref. Figure 201 and Figure 202)

NOTE: Horizontal stabilizer can be removed with vertical stabilizers installed. Support stabilizer during removal.

A. Horizontal Stabilizer Removal

(1). Remove seven screws securing center access plate to horizontal stabilizer.

(2). Disconnect position light electrical interconnect.

(3). On 500N, disconnect S.A.S. electrical interconnect.

(4). Remove cotter pin, nut, washer and bolt from center bellcrank shaft. Index mark bellcrank with grease pencil in relationship to shaft. Disconnect bellcrank.

(5). Remove nuts, washers and expandable bolts securing horizontal stabilizer to tailboom attachment clevis fittings. Remove horizontal stabilizer.

B. Horizontal Stabilizer Installation

NOTE: When installing horizontal stabilizer it may be necessary to loosen eye bolts and nuts to align with clevises, if so, install mounting expandable bolts first and torque per step (2). below, then torque clevis nuts to **80 - 120 inch-pounds (9.04 - 13.56 Nm).**

(1). Position horizontal stabilizer on tailboom attach fittings.

(2). Install expandable bolts, washers and nut. Torque to **30 - 40 inch-pounds (3.39 - 4.52 Nm)**. Install cotter pin.

(3). Connect position light/strobe light electrical connector.

(4). On 500N, connect S.A.S. electrical interconnect.

CAUTION When installing bellcrank on center bellcrank shaft it is possible to be one spline tooth off in either direction, install bellcrank centered on shaft (Ref. Sec. 67-20 -30).

(5). Connect bellcrank to center bellcrank shaft and install bolt, washers and nut. Torque nut to **30 - 40 inch-pounds (3.39 - 4.52 Nm)** and install cotter pin.

(6). Install center access plate with seven screws and washers.

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- Do not use clutch coupling shims under transmission input coupling. Inside diameter of clutch coupling shims, 1.260–1.270 inches (3.2004–3.2258 cm), is approximately 0.070 inch (1.778 mm) larger than inside diameter of shims used at transmission coupling. Incorrect diameters can cause an improperly seated shim, misalignment and cocked coupling.

NOTE: Transmission input coupling shims are laminated stock. Each lamination is 0.002 inch (0.051 mm) thick. Peel to thickness required.

(4). Add sufficient shims to get a measurement of 0.010 inch (0.254 mm) minimum between bolt seating surface on coupling and transmission input shaft.

(5). Lubricate input shaft splines with grease (CM111). Coat bolt threads with anti-seize compound (CM112). Reinstall coupling and bolt. Check coupling bolt for minimum drag of **25 inch-pounds (2.82 Nm)**. Torque bolt to **250 - 300 inch-pounds (28.25 - 33.90 Nm) plus drag torque**.

(6). Attach drive shaft to clutch coupling with four bolts and washers. Torque bolts to **50 - 70 inch-pounds (5.65 - 7.91 Nm)**.

(7). Manually align drive shaft and transmission input coupling flanges:

(8). Using feeler gage, measure gap between flanges. Gap should be 0.010 inch (0.254 mm) gap to 0.020 inch (0.508 mm) compression.

(a). If gap is 0.010 inch (0.254 mm) or less, attach upper end of drive shaft to transmission input coupling with four bolts and washers. Torque bolts to **50 - 70 inch-pounds (5.65 - 7.91 Nm)**.

(b). If gap exceeds 0.010 inch (0.254 mm), repeat step (3). thru (5). above, except install thickness of shims equal to measured gap, plus thickness that results in not more than 0.010 inch (0.254 mm) gap between coupling and drive shaft nor more than 0.020 inch (0.508 mm) compression of flexible couplings. Install four bolts and washers and torque bolts to **50 - 70 inch-pounds (5.65 - 7.91 Nm)**.

(9). Install access door and sound insulation over main transmission drive shaft.

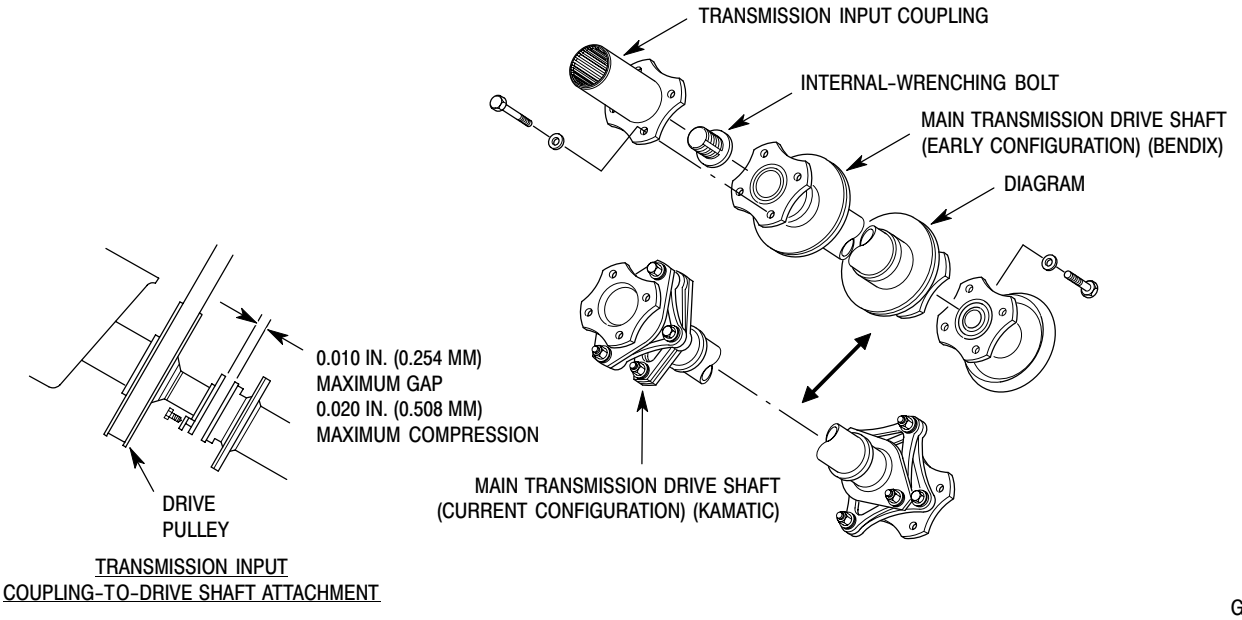


Figure 402. Main Transmission Drive Shaft Installation

5. Overrunning Clutch

The overrunning clutch transmits power from the engine to the main transmission drive shaft. The clutch disengages the engine from the remainder of the drive system in case of engine failure and during autorotations.

The clutch contains a sprag unit that disengages automatically when N_2 rpm is less than corresponding main rotor rpm.

Repair and overhaul information for the overrunning clutch can be found in COM.

6. Overrunning Clutch Replacement

(Ref. Figure 403 or Figure 404)

A. Overrunning Clutch Removal

Consumable Materials (Ref. Section 91-00-00)	
Item	Nomenclature
CM208	Barrier material

NOTE: For removal of only the internal clutch subassembly as an alternative to complete clutch removal, refer to Overrunning Clutch Subassembly Removal.

(1). Remove engine.

(2). Remove bolts, washers, nuts and engine shaft firewall seal from clutch.

NOTE: Removal of clutch coupling from clutch is unnecessary unless clutch is being replaced.

(3). Remove coupling bolt, packing, clutch coupling and coupling shim(s). Keep shim(s) with coupling for reuse. Reinstall bolt and packing to prevent spillage of lubricating oil from clutch housing during final steps of removal.

(4). On 369F5450 clutch, remove output shaft cover plate from back of engine accessory drive to gain access to clutch bolt.

(a). Insert tool (Ref. Figure 405) to engage bolt in back of clutch.

(b). Insert a long 3/8 inch (9.525 mm) hex wrench, approximately 10 inches (25.4 cm) long, through tool and into back of clutch assembly.

(c). While holding internal hex wrench [3/8 inch (9.525 mm)], turn external hex wrench [1.00 inch (2.54 cm)] counter-clockwise to remove bolt from back of clutch.

(5). Remove nuts and washers that secure overrunning clutch; remove clutch.

(6). If clutch is being replaced, install spare coupling bolt and O-ring or suitable plug in output shaft (clutch inner race bore) to prevent contamination during clutch handling, shipping or storage.

NOTE: Operating lubricant is an approved preservative for shipping or storage.

(7). Wrap clutch in barrier material (CM208) to protect splined areas of shafts.

B. Overrunning Clutch Installation

Consumable Materials (Ref. Section 91-00-00)	
Item	Nomenclature
CM111	Grease, aircraft
CM112	Anti-seize compound high temperature
CM125	Oil
CM126	Oil, turbine

(1). If clutch is new, (369A5350 clutch only) drain preservative oil. Trapped oil can be removed by inverting clutch a minimum of three times. Add lubricating oil (CM125 or CM126) (Ref. Sec. 12-00-00). Temporarily install coupling bolt and packing.

NOTE: Relubricate splines on clutch input shaft and splines inside engine power and accessory gearbox with grease (CM111) prior to reinstalling overrunning clutch.

(2). Coat clutch splines and internal splines of engine power accessory gearbox with lubricant (CM111). Insert overrunning clutch outer-race spline into engine and install six washers and nuts.
Deleted.

TAIL ROTOR DRIVE SHAFT REMOVAL/INSTALLATION

1. Tail Rotor Drive Shaft

The tail rotor drive shaft connects the main transmission and the tail rotor transmission. The total drive shaft length is approximately 13 feet long for 369D/E and approximately 14 feet long for 369FF. Flanges at each end of the shaft attach to flexible joint couplings on the transmission shafts.

2. Tail Rotor Drive Shaft Replacement

A. Tail Rotor Drive Shaft Removal

(Ref. Figure 401, and Figure 402)

(1). Remove (or open) tail rotor drive shaft access doors.

(2). Remove three bolts and washers that secure tail rotor drive shaft to output shaft coupling on main transmission.

(3). Disconnect chip detector wire from tail rotor transmission.

(4). Detach Sta. 284.00 bellcrank from tail rotor transmission.

(5). Remove nuts and washers that attach tail rotor transmission to tailboom.

CAUTION To prevent damage to transmission input shaft coupling during and after shaft removal, provide level support for both transmission and tail rotor, as weight of these items might buckle coupling diaphragm.

(6). With assistance in guiding shaft through damper, remove tail rotor, tail rotor transmission and tail rotor drive shaft as an assembly. Slowly and carefully slide assembly aft until drive shaft clears tailboom.

CAUTION Do not carry or otherwise support transmission by use of coupling. Use care with removal tools to prevent scratching of coupling diaphragms.

(7). Support assembly along its entire length, remove three coupling bolts and washers, and remove drive shaft from tail rotor transmission.

B. Tail Rotor Drive Shaft Installation with Bendix Couplings

(Ref. Figure 401) Whenever main transmission, tail rotor transmission, forward coupling bolt and/or socket, transmission couplings or coupling shims, tail rotor drive shaft or tailboom assembly have been replaced, start installation with step (1). below. If none of these components has been replaced, and only installation is involved, start with step (7). below.

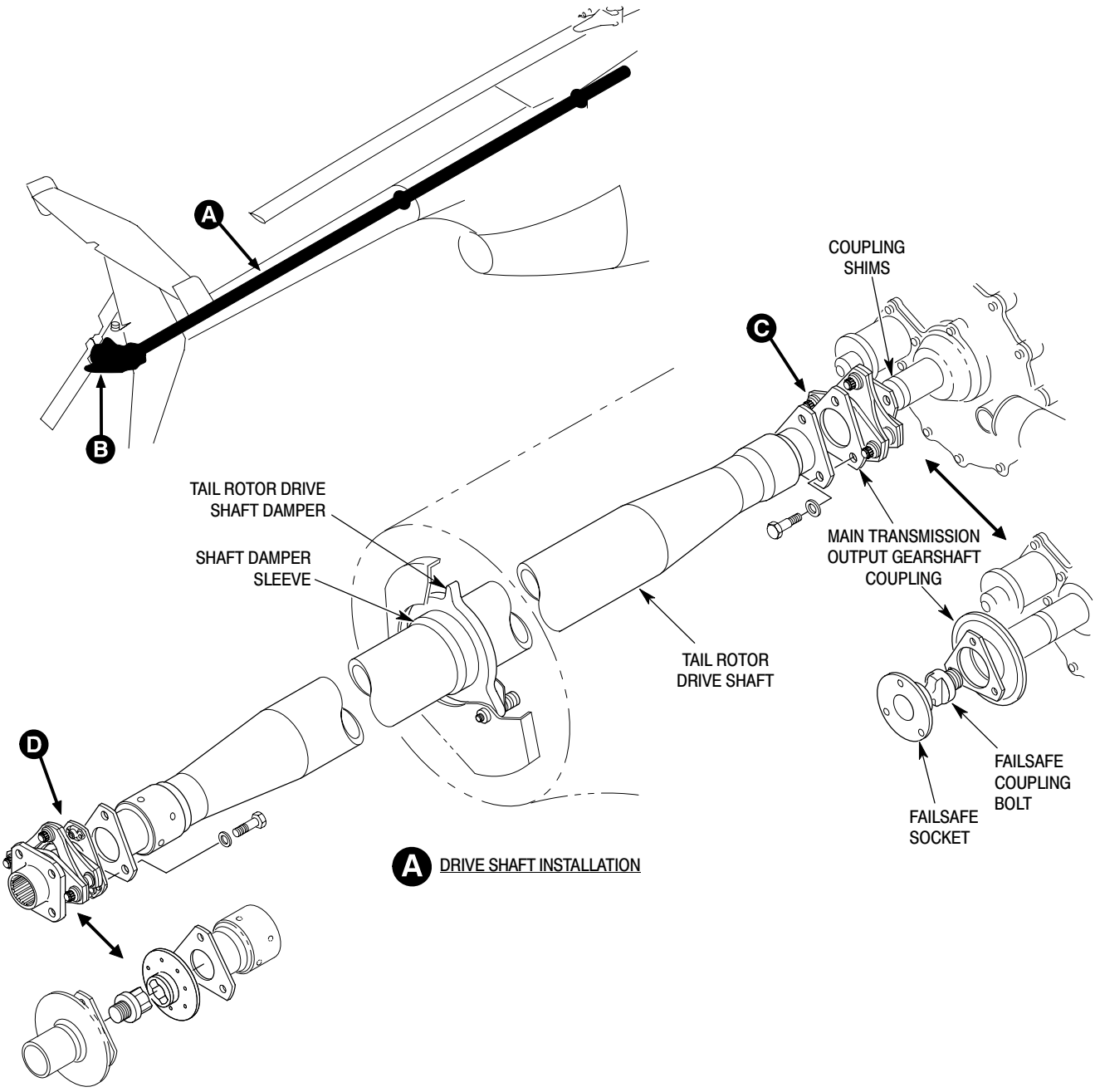
Consumable Materials
(Ref. Section 91-00-00)

Item	Nomenclature
CM111	Grease, aircraft
CM112	Anti-seize compound high temperature
CM115	Grease, oscillating bearing
CM311	Coating, logo white / Thinner
CM318	Primer

NOTE: If tail rotor drive shaft is replaced for torsional buckling, replace and discard transmission output gear shaft coupling bolt and socket, and tail rotor gearbox coupling and coupling bolt.

(1). Remove existing shims. Coat coupling splines with grease (CM111) and coupling failsafe bolt threads with anti-seize compound (CM112) before assembly. Install coupling and tighten failsafe 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). Determine shim thickness required at forward flexible coupling:



NOTES:

1. DO NOT LIFT TAIL ROTOR TRANSMISSION OR DRIVE SHAFT BY COUPLING. KEEP THE ASSEMBLY ALIGNED DURING REMOVAL.
2. SHIM AS REQUIRED.
3. ADD 0.005 IN. (0.127 MM) TO MEASURED GAP FOR MINIMUM SHIM THICKNESS.
4. HOLD COUPLING AT 1.370 IN. (34.798 MM) OD ONLY, TO BOTTOM COUPLING.
5. INSTALL BOLT WITH ANTI-SEIZE COMPOUND. MINIMUM DRAG TORQUE FOR COUPLING BOLT, 25 INCH-POUNDS (2.82 NM).
6. MINIMUM 0.010 IN. (0.254 MM) STEP BETWEEN AFT END OF OUTPUT SHAFT AND SHOULDER OF FORWARD COUPLING.
7. INSTALL WITH GAP EITHER SIDE OF FAILSAFE BOLT.

G63-1005-1B

Figure 401. Tail Rotor Drive Shaft Installation (369D/E/FF) (Sheet 1 of 3)

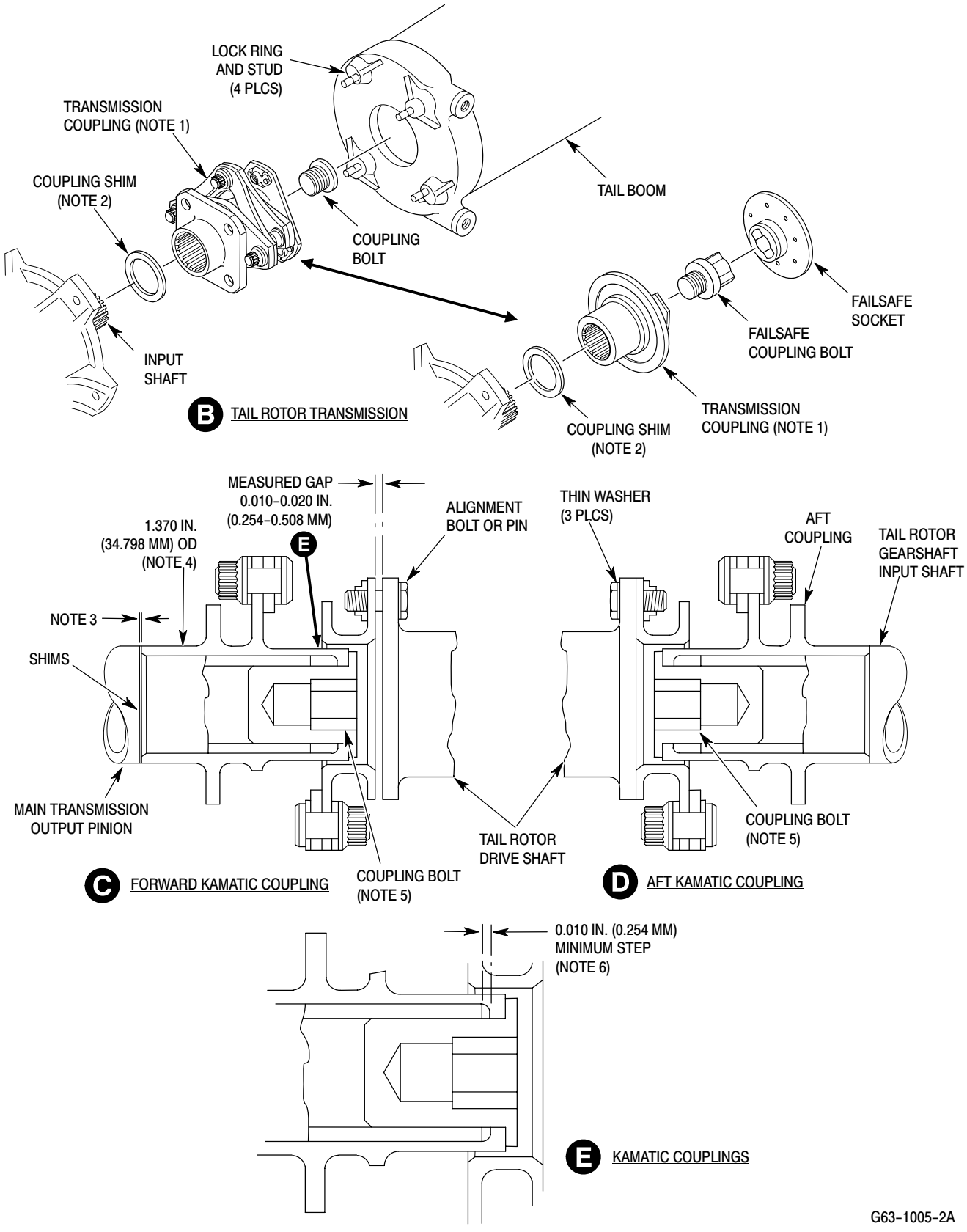


Figure 401. Tail Rotor Drive Shaft Installation (369D/E/FF) (Sheet 2 of 3)

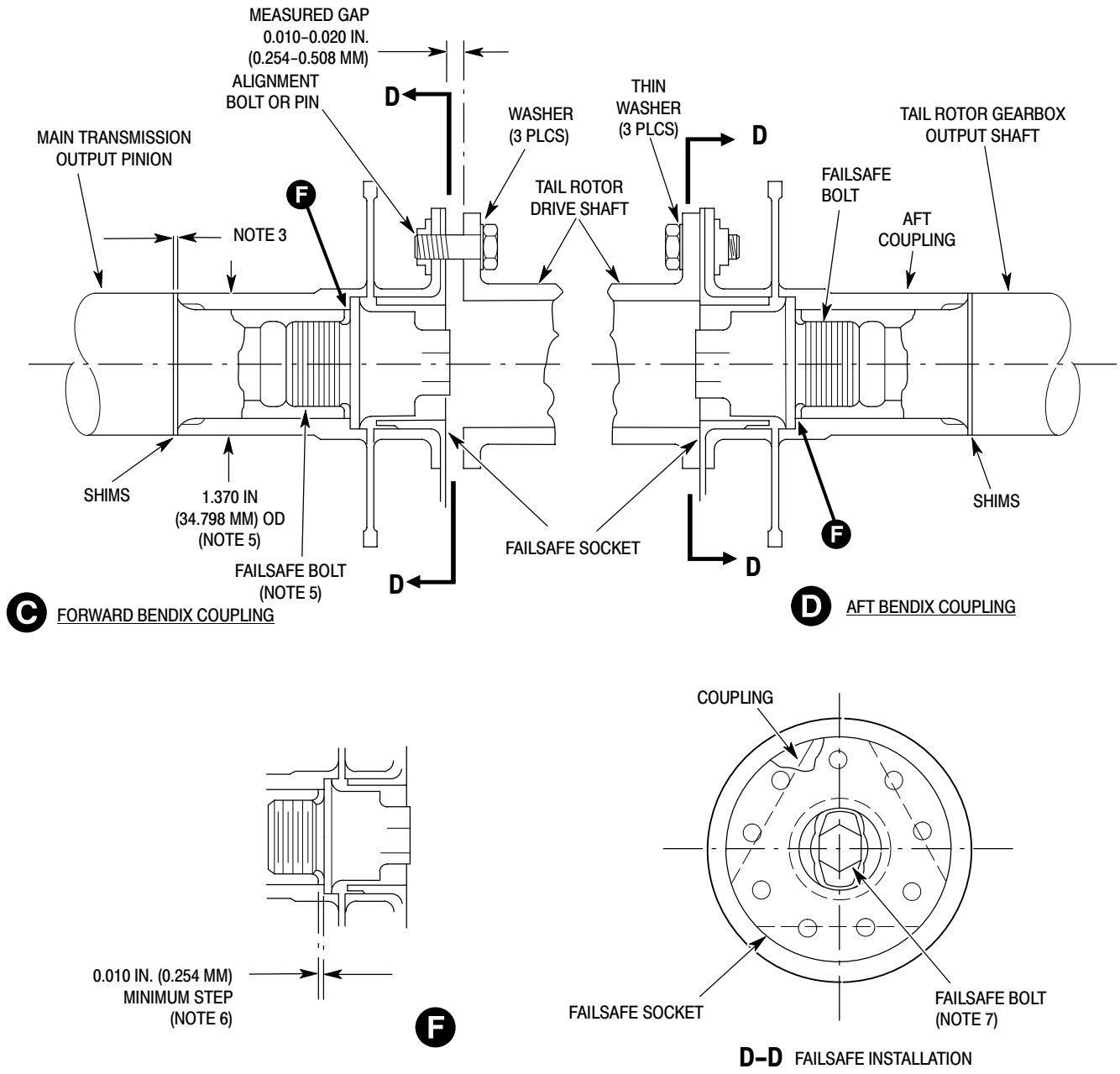


Figure 401. Tail Rotor Drive Shaft Installation (369D/E/FF) (Sheet 3 of 3)

(a). Install minimum shim thickness on main transmission output shaft.

CAUTION Bottom the flexible coupling by holding at the 1.370 inch (3.4798 cm) OD of coupling. Do not bottom coupling by pushing on drive shaft attach flange; doing so may damage coupling.

(b). Bottom forward coupling on main transmission output shaft.

(c). Measure step between aft end of output shaft and shoulder of flexible coupling, by bottoming coupling against shims (refer to **CAUTION** above).

NOTE: Maintain minimum 0.010 inch (0.254 mm) step between aft end of output shaft and coupling shoulder to prevent coupling bolt from bottoming on output shaft.

(d). Install additional shims to maintain 0.010 inch (0.254 mm) minimum step as required.

(3). Position failsafe socket on aft face of forward coupling so that three of the nine holes are indexed to the three nutplates of the coupling in such a way that maximum clearance is obtained between the bolt key and socket. Visually verify proper clearance before installing tail rotor drive shaft.

(4). Repeat previous step to install failsafe socket on input coupling of tail rotor transmission.

(5). Support entire length of tail rotor drive shaft and position end stamped **AFT** to align with tail rotor transmission coupling.

(6). Install three bolts and washers to connect tail rotor transmission coupling to shaft; torque bolts to **80 - 100 inch-pounds (9.04 - 11.30 Nm) plus drag torque**.

CAUTION

- Ensure security of tail rotor gearbox 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) (Ref. Sec. 63-25-10).
- When installing tail rotor transmission and drive shaft, do not compress the forward or aft couplings as damage to the coupling could result.

(7). With assistance, support transmission and shaft in line, for minimum deflection of coupling, and guide drive shaft carefully through tailboom and damper into position.

(8). Secure transmission to four tailboom mounting studs (Ref. Sec. 63-25-10). Install four washers and nuts, torque nuts to **75 - 95 inch-pounds (8.47 - 10.73 Nm) plus drag torque**.

(9). Align forward end of drive shaft with coupling on main transmission output gearshaft. Partially install two bolts as an alignment aid but do not tighten. Align drive shaft inspection markings. If any of four white stripes is indistinct or does not exist, paint (CM311) replacement stripe:

(10). Obtain 0.010-0.020 inch (0.254-0.508 mm) gap between forward flange of tail rotor drive shaft and aft end of socket, using the following procedure:

(a). Back off three attach bolts on forward flange of tail rotor drive shaft assembly 0.050-0.100 inch (1.270-2.540 mm).

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

(c). Remove end play in tail rotor transmission by applying force to tail rotor blades in opposite direction of operational rotation (while holding forward coupling of tail rotor driveshaft on main transmission output shaft to prevent rotation). Do not push tail rotor drive shaft fore or aft.

(d). Using feeler gage, measure gap between socket and flange of tail rotor drive shaft. Socket flange must be in full contact with flange of flexible coupling.

(e). With assistance, remove tail rotor transmission and driveshaft in line for minimum deflection of coupling.

(f). Using measured gap from step (d). above, add or remove required number of shims at tail rotor transmission input pinion shaft and coupling to obtain specified gap of 0.010–0.020 inch (0.254–0.508 mm).

NOTE:

- Maintain minimum 0.010 inch (0.254 mm) step between coupling shoulder and output shaft (Ref. step (2).).
- If less than specified gap, 0.010–0.020 inch (0.254–0.508 mm) exists under minimum shim requirements, install a maximum of one HS306–326 or HS306–326H washer on each of the four tail rotor transmission mounting studs, between gearbox housing and boom fitting. Apply primer (CM318) to both sides of washer at installation. After washer installation, repeat step (10).

(11). Coat forward coupling splines with grease (CM111) and coupling bolt threads with antiseize compound (36) before assembly. Install coupling and torque failsafe 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 minimum (2.82 Nm), 200 inch–pounds (22.60 Nm) maximum.)

(12). With assistance, support transmission and shaft in line for minimum deflection of coupling and guide drive shaft carefully through tailboom and damper into position.

(13). Apply primer (CM318) to the four gearbox mounting studs. Install nuts and washers while the primer is still wet; torque evenly to **75 - 95 inch-pounds (8.47 - 10.73 Nm) plus drag torque**.

CAUTION Verify that a minimum of (1) one thread protrudes through each nut from the four tail rotor transmission mounting studs. If less than one thread is showing, refer to CSP–DEF–6, Structural Repair Manual, to replace with a longer MS1992A803–14 stud and insert.

(14). Install three bolts and washers at forward end of tail rotor drive shaft to connect to forward coupling; torque bolts to **80 - 100 inch-pounds (9.04 - 11.30 Nm) plus drag torque**.

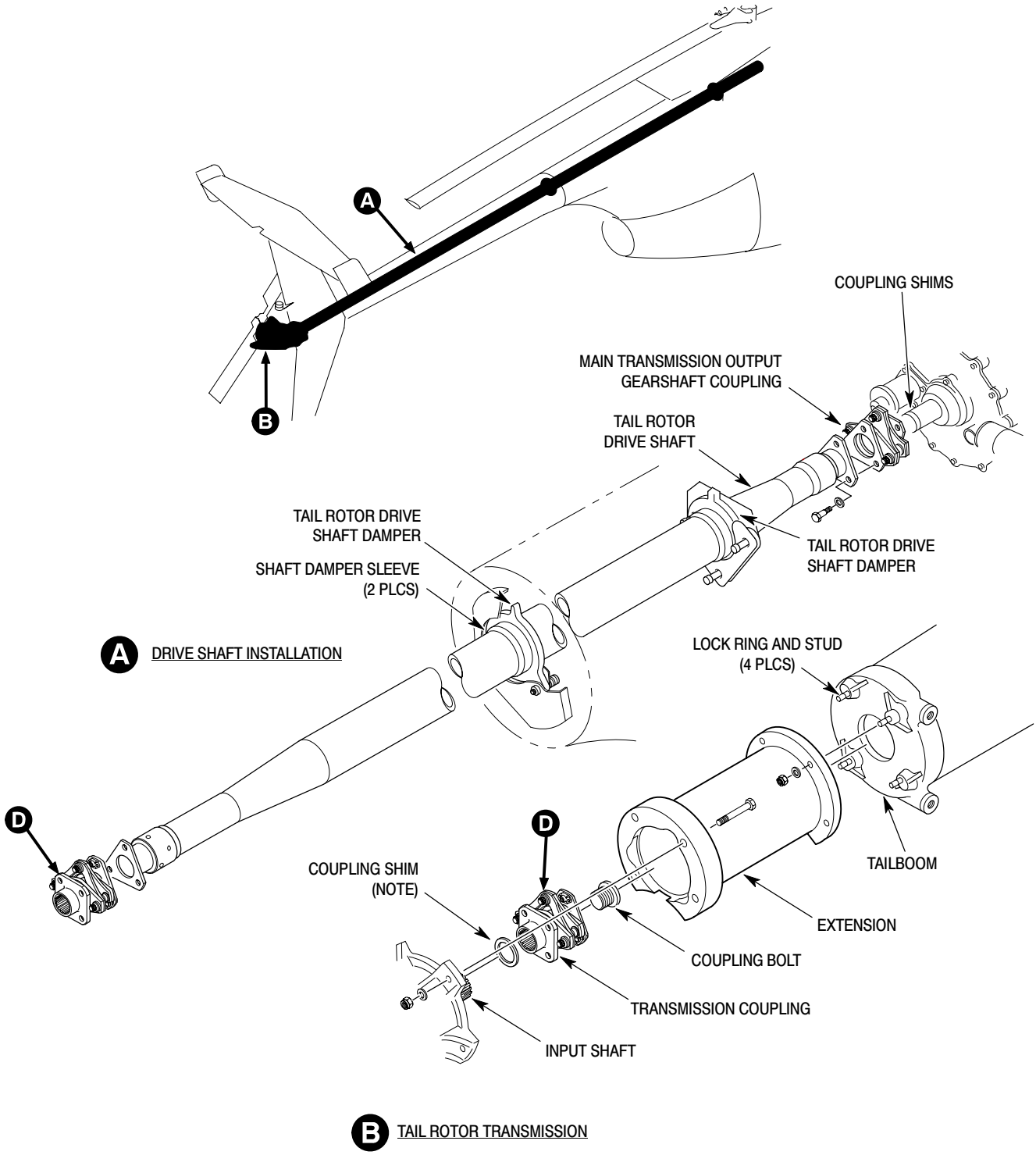
(15). Connect electrical wire to tail rotor transmission chip detector. Torque nut to **12 - 15 inch-pounds (1.36 - 1.69 Nm)**.

(16). Coat pin of Sta. 284.00 bellcrank with grease (CM111) and insert it into bearing in tail rotor pitch control. Pivot bellcrank to align with mating hole in tail rotor transmission and install bolt, washers, nut and cotter pin.

(17). Check transmission oil level and service as required.

(18). Slowly rotate drive shaft and visually check to ensure shaft is not bent and for not less than 0.250 inch (6.35 mm) clearance between shaft and fairing tube at Sta. 137.5. In addition, check for minimum clearance of 0.190 inch (4.83 mm) between shaft and cooling blower scroll.

(19). Install all access doors and covers.



NOTE:
SHIM AS REQUIRED.

G63-1006

Figure 402. Tail Rotor Drive Shaft Installation (369FF)

C. Tail Rotor Drive Shaft Installation with Kamatic Couplings

(Ref. Figure 401 and Figure 402) Whenever main transmission, tail rotor transmission, transmission couplings, coupling shims, tail rotor drive shaft or tailboom 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 (5). below.

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

Item	Nomenclature
CM111	Grease, aircraft
CM112	Anti-seize compound high temperature
CM115	Grease, oscillating bearing
CM311	Coating, logo white / Thinner
CM318	Primer

NOTE:

- Kamatic couplings do not require failsafe bolts or sockets.
- When installing 369D25501-3 Kamatic coupling, install SKCP2554-13 coupling bolt supplied with the Kamatic coupling.
- If tail rotor drive shaft is replaced for torsional buckling, replace and discard main transmission output gear shaft coupling, tail rotor 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 tail rotor gearbox 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; 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 entire length of tail rotor drive shaft and position end marked **AFT** to align with tail rotor transmission coupling.

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

CAUTION Ensure security of tail rotor gearbox 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) (Ref. Sec. 63-25-10).

(5). With assistance, support tail rotor transmission and shaft in line, for minimum deflection of coupling, and guide drive shaft carefully through tailboom and damper into position.

(6). Secure transmission to four tailboom mounting studs with washers and nuts; torque to **75 - 95 inch-pounds (8.47 - 10.73 Nm) plus drag torque**.

(7). Align forward end of driveshaft with coupling on main transmission output gearshaft. Partially install two bolts as an alignment aid but do not tighten. Align drive shaft inspection markings. If any of four white stripes is indistinct or does not exist, paint replacement stripes.

(8). Obtain 0.010-0.020 inch (0.254-0.508 mm) gap between forward flange of tail rotor 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 tail rotor output 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 tail rotor output shaft.

(c). Remove end play in tail rotor transmission by applying force to tail rotor blades in opposite direction of operation (while holding forward coupling of tail rotor drive shaft on main transmission to prevent rotation). Do not push tail rotor drive shaft fore or aft.

(d). Using feeler gage, measure gap between forward coupling flange and flange of tail rotor drive shaft. Record the gap.

(e). With assistance, remove tail rotor transmission and driveshaft in line for minimum deflection of coupling.

(f). Using measured gap from step (d). above, add or remove required number of shims at tail rotor transmission input pinion shaft and coupling to obtain specified gap of 0.010–0.020 inch (0.254–0.508 mm).

NOTE:

- Maintain minimum 0.010 inch (0.254 mm) step between coupling shoulder and output shaft (Ref. Figure 401).
- If less than specified gap, 0.010–0.020 inch (0.254–0.508 mm) exists under minimum shim requirements, install a maximum of one HS306–326 or HS306–326H washer on each of the four tail rotor transmission mounting studs, between gearbox housing and boom fitting. Apply primer (CM318) to both sides of washer at installation. After washer installation, repeat step (10).

(9). Re–install coupling and torque coupling bolt to **250 - 300 inch-pounds (28.25 - 33.90 Nm) plus drag torque**.

(10). With assistance, support tail rotor transmission and shaft in line for minimum deflection of coupling and guide drive shaft carefully through tailboom and damper into position.

(11). Secure transmission to four tailboom mounting studs with washers and nuts; torque to **75 - 95 inch-pounds (8.47 - 10.73 Nm) plus drag torque.**

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

(13). Connect electrical wire to tail rotor transmission chip detector. Torque nut to **12 - 15 inch-pounds (1.36 - 1.69 Nm)**.

(14). Coat pin of Sta. 284.00 bellcrank with grease (CM111) and insert into bearing in tail rotor pitch control. Pivot bellcrank to align with mating hole in tail rotor transmission and install bolt, washers, nut and cotter pin.

(15). Check transmission oil level and service as required (Ref. Sec. 12–10–00).

(16). Slowly rotate driveshaft 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.

(17). Install all access doors and covers.

3. Tail Rotor Drive Shaft Damper

(Ref. Figure 603) The tail rotor drive shaft damper is a graphite–filled teflon plate that controls and limits deflection of the tail rotor drive shaft about its approximate mid–point. The damper is spring–loaded against a structural support bracket mounted on the aft section tailboom fairing. On 369FF Model helicopters, a second damper is located at Sta. 137.50 (Ref. Figure 602).

4. Tail Rotor Drive Shaft Damper Replacement

(Ref. Figure 602)

(1). Remove boom–bolts access covers.

(2). Remove tail rotor drive shaft.

(3). Remove two bolts, washers, springs, thin washers, plate and spacers and damper.

NOTE: The damper at Sta. 137.50 (369FF only) has 369DSK152-13 bushings installed inside the Teflon Graphite Damper in conjunction with the spacers.

(4). Position new damper over mounting holes in support bracket. Install plate and spacers with bolts, washers, springs and spacer washers.

CAUTION Ensure washers under boltheads are seated against spacer when tightened. Bolts wear rapidly if clamp-up is not solid.

(5). Adjust damper friction.

(6). Install tail rotor drive shaft.

(7). Displace damper so that it touches tail rotor drive shaft.

(8). Use wire gage to measure damper to shaft clearance 180° from contact point. Minimum acceptable clearance is 0.020 inch (0.508 mm).

(9). Repeat steps (7). and (8). above at 90° intervals from initial check point.

(10). Install boom-bolts access covers.

(5). Secure oil cooler outlet duct to oil cooler with four bolts, washers and nuts.

(6). Install tee (with drain cap), elbow and tubes that run from oil cooler to oil cooler bypass valve housing, applying light coat of antiseize compound (CM112) to threads.

(7). Install oil drain tube and fitting on tee.

(8). Install compressor cooling duct.

(9). Fill main transmission lubrication system (Ref. Sec. 12-00-00).

9. Main Transmission Oil Temperature Sender Replacement

(Ref. Figure 404) The oil temperature sender for the main transmission lubrication system is installed in a housing inserted in the 1/2 inch oil line to **IN** port of lubrication pump. Switch contacts close when oil temperature exceeds 240° ±l0°F (116° ±5°C).

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

Item	Nomenclature
CM112	Anti-seize compound high temperature
CM726	Tape, teflon

(1). Remove lockwire and detach electrical wire from sender terminal post. Position container for draining transmission oil cooler line. Remove two set screws securing sender within sender housing. Unscrew sender and drain oil in container. Plug housing to prevent oil drainage.

(2). Apply a light coat of antiseize compound (CM112) or tightly wrap two or three turns of teflon tape (CM726) on tapered threads of sender. Screw temperature sender into housing; torque to **30 - 40 inch-pounds (3.39 - 4.52 Nm)**. Install set screws until light contact is made with sender. Lockwire hex of sender to drilled head of ground wire screw in sender housing. Connect electrical wire to sender terminal and replenish transmission with oil lost (Ref. Sec. 12-00-00).

10. Main Transmission Oil Pressure Sender Replacement

(Ref. Figure 404) The main transmission oil pressure sender provides a ground to cause the **XMSN OIL PRESS** warning light to illuminate when oil Pressure is low. It also provides a ground to the running-time meter. Sender's normally-closed contacts open when oil pressure increases to 15 ±2 psi (103 ±14 kPa); simultaneously the sender's normally-open contacts close.

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

Item	Nomenclature
CM112	Anti-seize compound high temperature
CM726	Tape, teflon

(1). Detach electrical wire or wires and using absorbent cloth, unscrew sender from transmission.

(2). Apply light coat of antiseize compound (CM112) or wrap two or three turns of teflon tape (CM726) on tapered threads of sender. Screw in sender; torque to **30 - 40 inch-pounds (3.39 - 4.52 Nm)**. Connect wire; make sure that connection is clean and tight. If three wires are present, for information on connection of third wire refer to wiring diagram for running time meter.

11. Liquid Level Plug Replacement

(1). Drain oil from transmission until oil level is well below edge of plug port (Ref. Sec. 12-00-00).

(2). Remove safetywire from plug.

(3). Remove plug by unscrewing counterclockwise.

(4). Remove and discard O-ring. Install new O-ring on plug.

(5). Install plug by screwing clockwise. Torque plug to **80 - 90 inch-pounds (9.04 - 10.17 Nm)**; install safetywire.

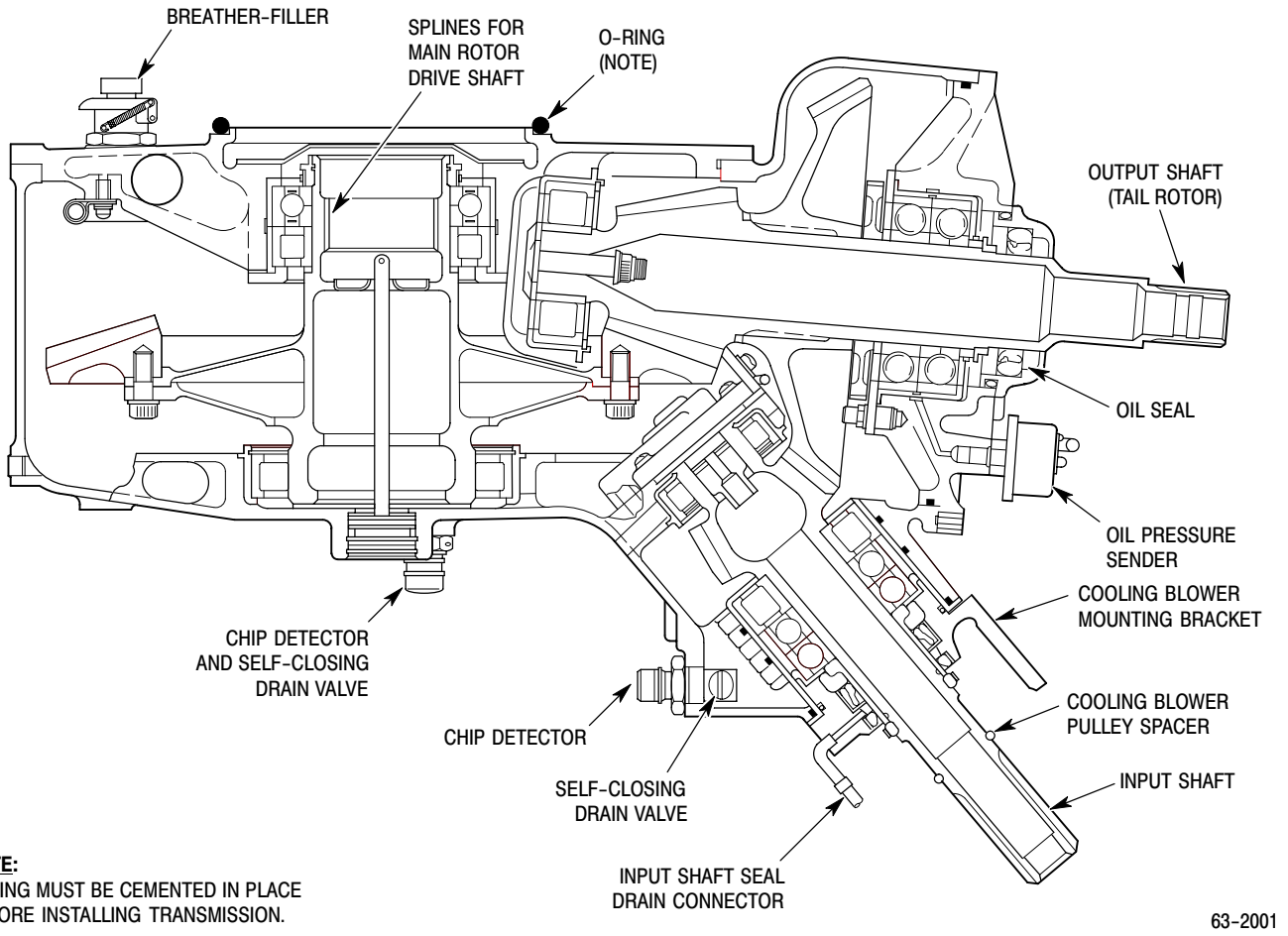


Figure 404. Main Transmission – Cross–Section View

12. Chip Detector Replacement

(Ref. Figure 404) For removal and installation instructions, refer to Draining Main Transmission (Ref. Sec. 12-00-00). For functional test information for detector circuit, refer to Sec. 95-30-00.

13. Cooling Blower Replacement

A. Cooling Blower

(Ref. Figure 405) The cooling blower is mounted to a bracket on the aft underside of the main transmission and coupled to the transmission input shaft by a pulley-driven belt. The blower exhausts air through the engine oil cooler and the main transmission oil cooler. Exhaust air from transmission and engine oil coolers is directed at various external portions of the engine and engine accessories.

B. Cooling Blower Removal

(Ref. Figure 405)

(1). Remove main transmission drive shaft and blower access door.

(2). Remove coupling bolt, coupling, shim(s) and pulley from transmission input shaft.

(3). Disconnect cooling blower drain tube. Loosen tie-down straps on blower duct rubber connectors and roll back connectors to disconnect ducts from cooling blower.

(4). Cut lockwire and remove four bolts attaching mounting bracket to transmission. Remove two shims inserted between bracket and transmission pad.

(5). Remove mounting bracket (with blower, pulley and belt) from helicopter.

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.

C. 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). Make sure belt tracks correctly (Ref. Cooling Blower Belt Tracking).

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

(10). Install access panels.

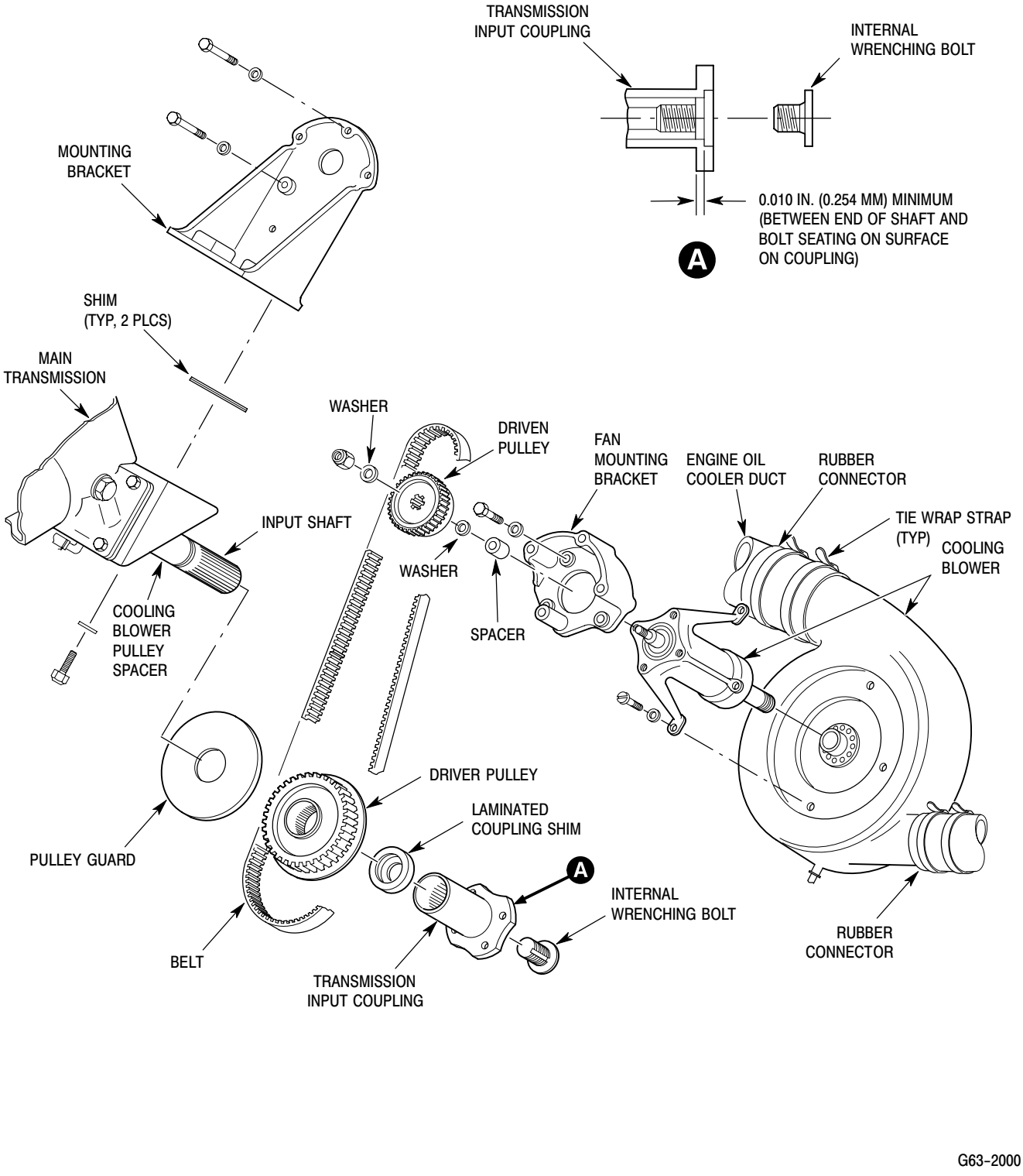


Figure 405. Cooling Blower Installation (369D25100 Transmission)

D. Cooling 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).

CAUTION When installing pulley and guard, make sure the spring pin in pulley is fully engaged inside hole in pulley guard. If the spring pin does not align correctly with hole in pully guard, the torque will be incorrect.

(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. 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). **369H, D, E, F, and 500N -** Make sure belt tracks correctly (Ref. Cooling Blower Belt Tracking).
(14). Connect drain tube to cooling blower scroll fitting. Clamp tube to fitting with two turns of lockwire (CM702).
(15). Roll exhaust duct rubber connectors onto scroll outlets (transmission oil cooler duct and engine oil cooler duct) and secure with tie straps.

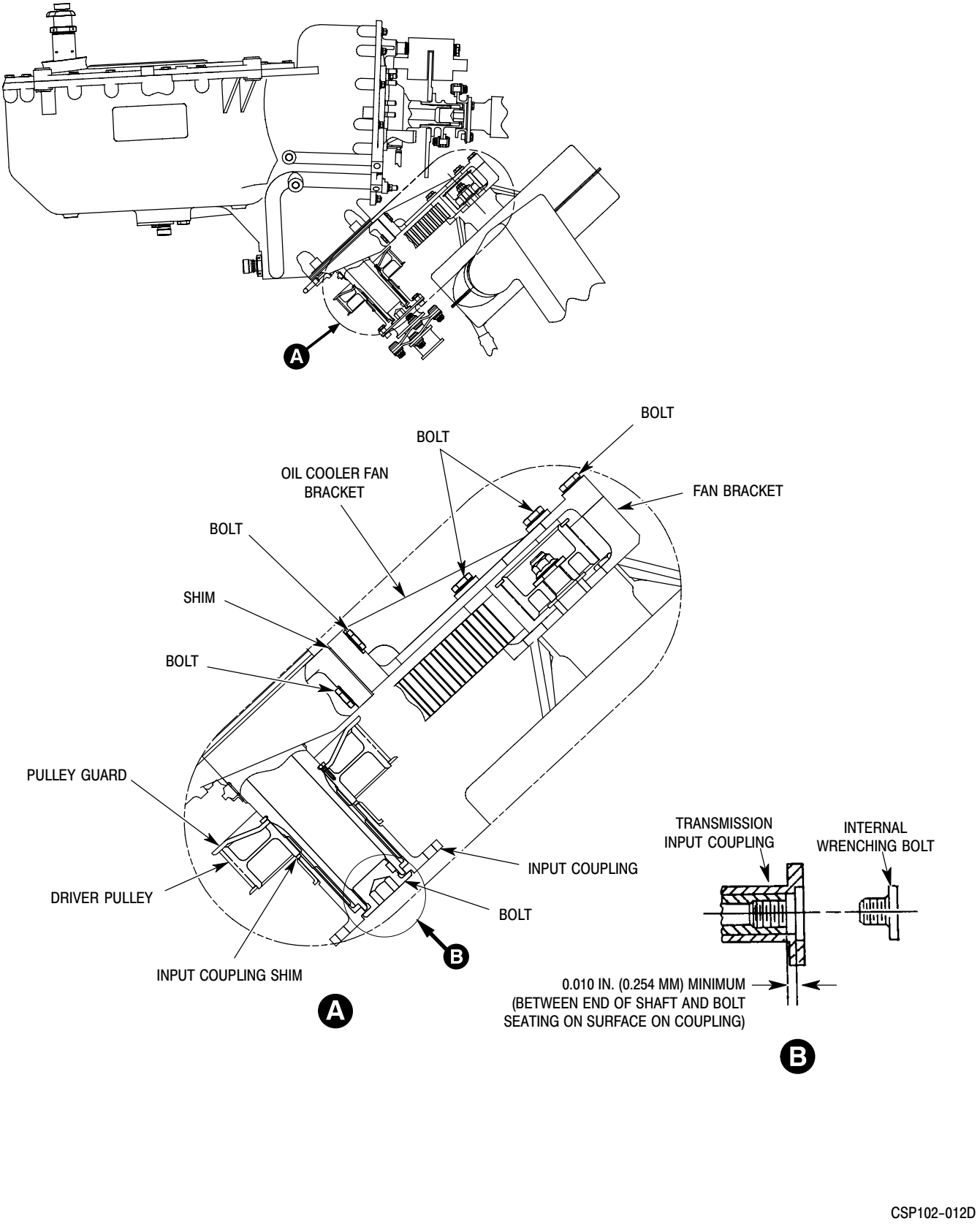


Figure 406. Oil Cooler Blower Installation (369F5100 Transmission)

E. 369H, D, E, F, and 500N – Cooling Blower Belt Tracking

(Ref. Figure 407)

(1). Make sure the oil cooler belt tracks correctly.

(2). Rotate the lower driver pulley with your hand in a clockwise direction (as you look at the main rotor transmission input). Make sure the belt tracks axially away from the blower on the upper driven pulley.

(3). Rotate the lower driver pulley by hand in a counter-clockwise direction. Make sure the belt tracks axially towards the blower on the upper driven pulley.

(4). If the oil cooler belt does not track correctly, replace with a serviceable belt.

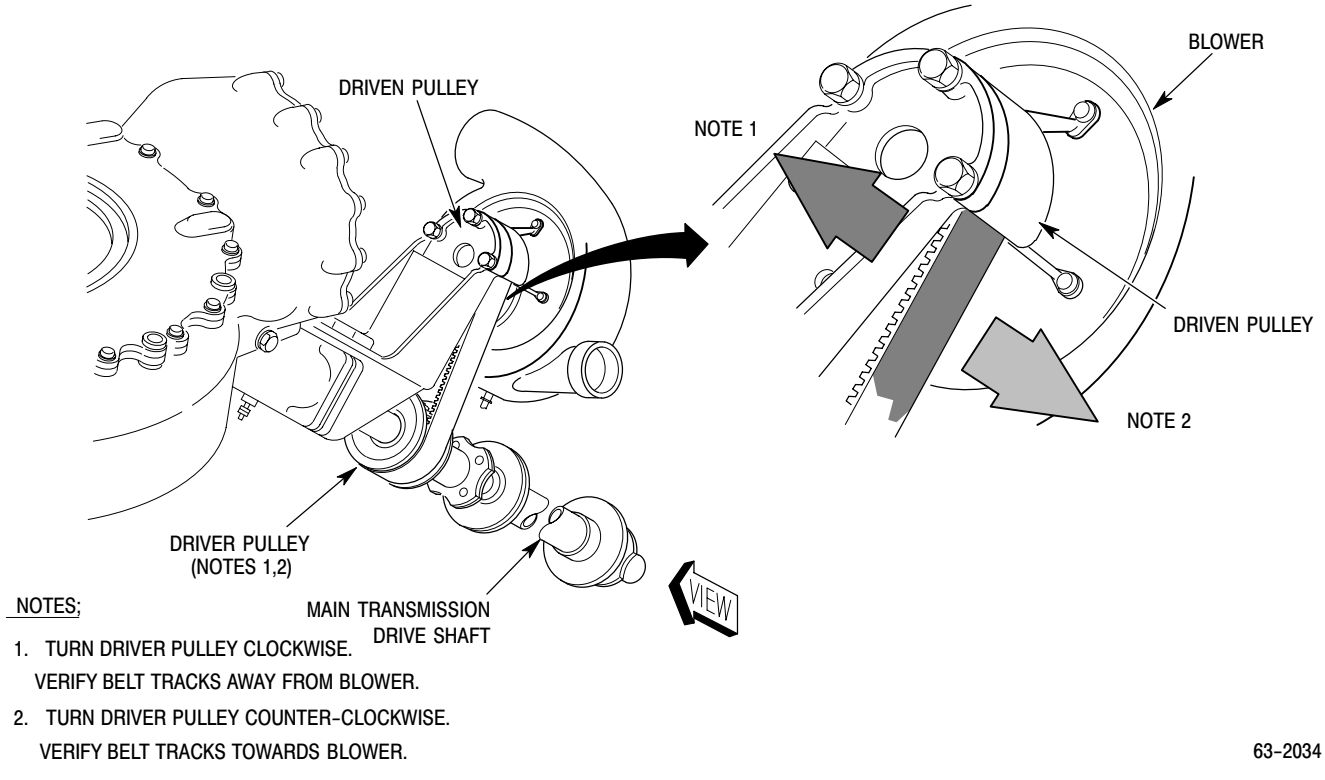


Figure 407. Cooling Blower Belt Tracking

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(9). Remove fluid catch containers and hoses. Ensure both bleed screws are tightly closed. Raise brake handle to stowed position and engage in handle retainer assembly. Verify that caliper pistons (and attached brake pucks) are retracted when handle is raised.

(10). Make final check of fluid level in master cylinder reservoir and replenish, if necessary. Secure gasket and cap with attaching screws.

(11). Connect tube assembly to nipple in cap and to reducer in relief valve and tighten tube nuts.

6. Rotor Brake Component Repair

The master cylinder assembly or caliper assembly may be overhauled as necessary. Overhaul kits are available from MD Helicopters Inc. or an approved MD Helicopter service center. Other parts must be replaced when damaged or otherwise unserviceable.

7. Master Cylinder Assembly Overhaul

(1). Remove defective master cylinder assembly.

(2). Disassemble unit and replace defective parts with components of overhaul kit (Vendor PN 12-8310), using manufacturer's instructions supplied with kit.

(3). Install overhauled master cylinder assembly.

8. Caliper Assembly Overhaul

(1). Remove defective caliper assembly.

(2). Disassemble unit and replace defective parts with components of overhaul kit (Vendor PN 12-11780), using manufacturer's instructions supplied with kit.

(3). Install overhauled caliper assembly.

Table 201. Troubleshooting Rotor Brake Installation

Symptom	Isolating Step	Corrective Action
Brake actuating handle creeps downward under sustained force, with hydraulic fluid leakage from master cylinder assembly.	Defective master cylinder assembly.	Remove defective master cylinder assembly and replace with new unit, or overhaul and reinstall old unit.
Brake actuating handle creeps downward under sustained force, with hydraulic fluid leakage from caliper assembly.	Defective caliper assembly.	Remove defective caliper assembly and replace with new unit, or overhaul and reinstall old unit.
'Spongy' feel at brake actuating handle when force is applied.	Air in hydraulic system.	Bleed air from hydraulic system.
	Hydraulic fluid at low level in master cylinder reservoir.	Add fluid to master cylinder assembly and bleed air from hydraulic system.
Rotor brake system fails to slow rotor effectively.	Any of above components or system faults.	Follow applicable corrective action procedures.
	Brake pucks worn excessively.	Remove defective caliper assembly, replace defective pucks and reinstall repaired unit.
Brake pucks create noises, such as squeals or squeaks, when brakes are applied.	Glazed or worn brake pucks.	Remove defective caliper assembly, replace defective pucks and reinstall repaired unit.
Brake disc creates noises, such as squeals or squeaks, when brakes are applied.	Scored or damaged brake disc.	Remove defective brake disc and replace with new disc.

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ANTI–TORQUE FAN REMOVAL/INSTALLATION

1. Anti–Torque Fan Assembly

The purpose of the fan is to provide anti–torque control using a variable flow of air, across variable pitch blades, down the tailboom. The anti–torque fan liner, felt metal seal, provides a controlled gap between the fan and the felt metal seal for optimum efficiency of the fan during flight.

NOTE: The NOTAR® anti–torque control system must be re–rigged immediately after replacement of any component, control rods, or linkages, and if helicopter operation reveals a rigging deficiency.

2. Anti–Torque Fan Replacement

(Ref. Figure 401 and Figure 402)

Special Tools (Ref. Section 91–00–00)

Item	Nomenclature
ST605	Fan nut socket

A. Anti–Torque Fan Removal

(1). Remove tailboom (Ref. Sec. 53–40–30).

(2). Remove nut and lock washer from aft tube assembly.

(3). Remove fan pitch control tube (Ref. Sec. 67–20–30, Fan Pitch Control Tube Removal).

(4). Remove six bolts, washers and pitch control housing from fan.

(5). Remove lock washer from nut and shaft by releasing the holding tangs from lock nut and pull locking ring from support shaft knurl.

(6). Remove locknut in a counter–clockwise direction, using coupling socket (ST605) and coupling holding fixture tool.

(7). Remove washer from shaft.

(8). Remove fan from helicopter.

B. Anti–Torque Fan Installation

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

Item	Nomenclature
CM702	Lockwire CRES

(1). Align and install fan assembly on support shaft.

(2). Install washer on shaft.

(3). Install locknut and torque nut to **40 - 42 foot-pounds (54 - 57 Nm)**. Install lock washer.

(4). Install pitch bearing housing using six bolts and washers, Torque bolts to **80 - 100 inch-pounds (9.04 - 11.30 Nm) and lockwire** (CM702).

(5). Install fan pitch control tube (Ref. Sec. 67–20–30, Fan Pitch Control Tube Installation).

(6). Install tailboom (Ref. Sec. 53–40–30).

3. Anti–Torque Fan Blade Replacement

(Ref. Figure 401)

NOTE: When a blade needs replacement for any reason, whether it be service related or at overhaul, replace associated bolt, washer, and nut.

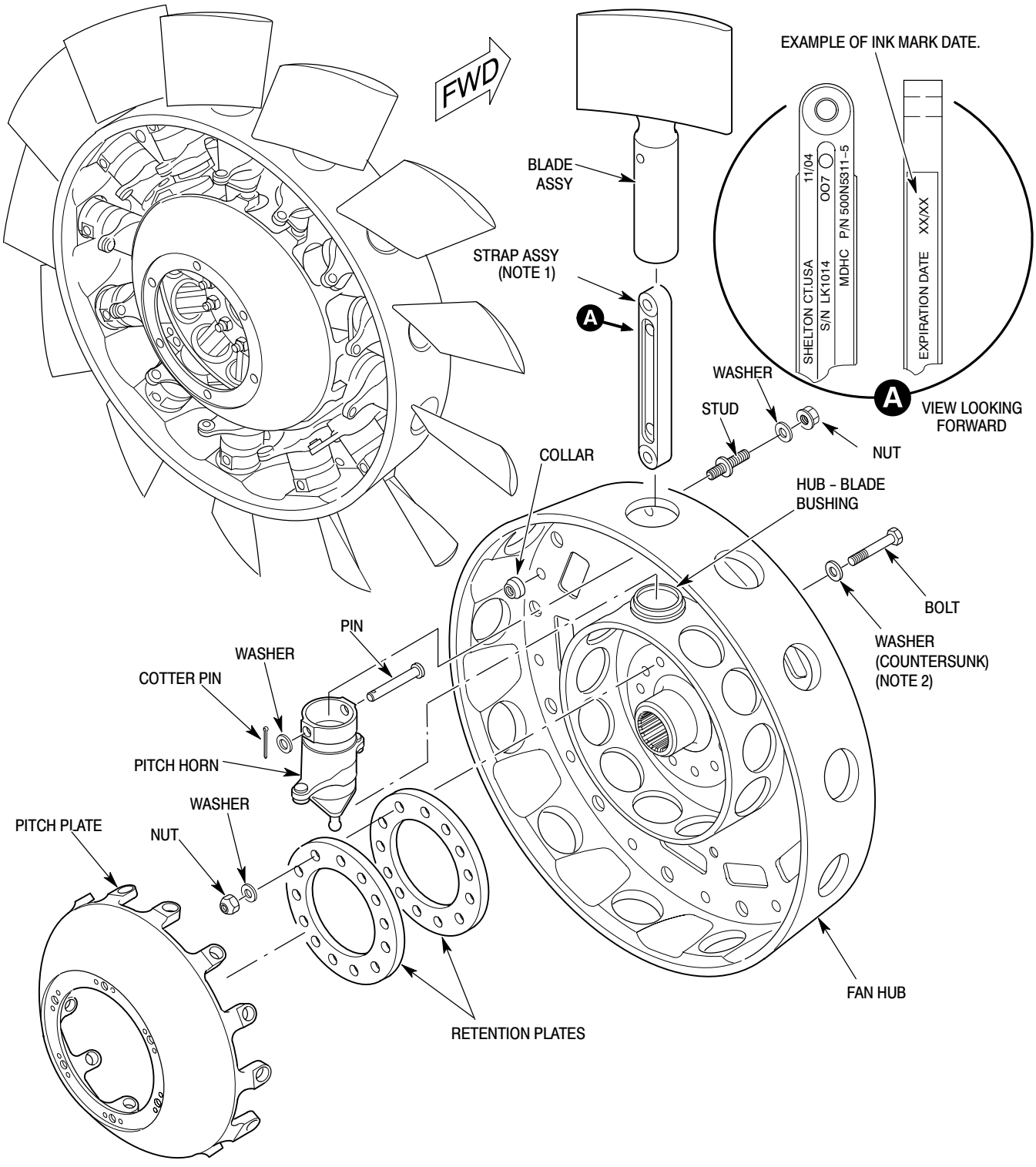
A. Anti–Torque Fan Blade Removal

(1). Remove anti–torque fan from helicopter (Ref. Anti–Torque Fan Removal).

(2). Remove fan blade from strap assembly by removing cotter pin, washer and pin.

B. Anti–Torque Fan Blade Installation

(1). Install fan blade and align retention hole with upper strap assembly retention hole.



NOTE:

1. INSTALL STRAP WITH SERIAL NUMBER FACING AFT DIRECTION.
2. INSTALL WASHER WITH COUNTERSINK AGAINST BOLT-HEAD.

G64-2005C

Figure 401. Anti-Torque Fan

(2). Install pin, washer and cotter pin.

(3). Reinstall anti-torque fan in helicopter (Ref. Anti-Torque Fan Installation).

(4). Perform fan balance check (Ref. Sec. 18-20-30, Fan Balance Check).

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

Item	Nomenclature
CM312	Ink stamp, permanent

4. Fan Blade Strap and Pitch Horn Replacement

(Ref. Figure 401) Remove and install the pitch horn and strap assembly using the following procedures.

NOTE:

- The following procedure covers the individual removal of one strap assembly and pitch horn. If disassembly of all is required, use the following steps for each one requiring removal.
- When strap is replaced, replace related bolt, washer, and nut.

A. Fan Blade Strap and Pitch Horn Disassembly

(1). Remove anti-torque fan from helicopter (Ref. Anti-Torque Fan Removal).

(2). Remove fan blade(s) (Ref. Anti-Torque Fan Blade Replacement).

(3). Remove bolt and washer retaining bottom half of strap assembly between two retention plates.

(4). Remove strap assembly thru top hole of fan hub.

(5). Remove pitch horn from fan hub.

B. Fan Blade Strap and Pitch Horn Reassembly

NOTE: Counterweights on pitch arms are set by the factory; do not attempt to adjust.

(1). Install pitch horn in fan assembly. Ensure ball on lower side of pitch horn is inserted in bushing of pitch plate.

NOTE: Inspect strap assembly for condition and expiration date. Pay particular attention to area around the two spools. Inspect for cracks in the polyurethane coating. If any cuts or breaks are found that exceed 0.020 inch (0.508 mm) in depth or 0.25 inch (6.35 mm) in length, replace the strap.

- Tension-torsion straps have a life limit that starts when their package is opened. If the date the package was opened is unknown, the 5 year calendar life is based on the manufacturing cure date.
- Tension-torsion straps can be put back in their package, and life limit not started, if not out of the package more than five days.

(2). If tension-torsion strap is removed from package for no more than five days, do the steps that follow:

(a). Replace desiccant in package, use desiccant (CM826).

NOTE: If you can not seal package; put, tension-torsion strap, package, and desiccant (CM826) in new plastic bag.

(b). Put tension-torsion strap in package and seal package opening with tape.

(c). Put package in box and seal box with tape.

(3). If replacement strap is new, remove from package and write the words **EXPIRATION DATE** on the strap face and date five years after the package is opened. Use permanent ink (CM312).

(4). Make an item component record card for each tension-torsion strap.

NOTE: Install tension-torsion straps so that the cure date is in view when fan is assembled.

(5). Insert strap assembly thru top of fan hub and pitch horn until lower (smaller diameter) hole is aligned between holes of two retention plates.

(6). Install blade and align spar before torquing inboard nut, this ensures proper alignment of strap with blade.

(7). Install new bolt, washers (countersunk washer against bolt-head), and nut thru holes of retention plates and of strap assembly.

(8). Install fan blade(s) and torque bolts to **100 inch-pounds (11.30 Nm)** (Ref. Anti-Torque Fan Blade Installation).

(9). Reinstall anti-torque fan in helicopter (Ref. Anti-Torque Fan Replacement).

(10). Perform fan balance (Ref. Sec. 18-20-30, Fan Balance Check).

5. Retention Plate and Pitch Plate Replacement

(Ref. Figure 401) Remove and install the retention strap and pitch plate using the following procedures.

A. Retention Plate and Pitch Plate Disassembly

(1). Remove anti-torque fan from helicopter (Ref. Anti-Torque Fan Removal).

(2). Remove fan blades (Ref. Anti-Torque Fan Blade Replacement).

(3). Remove strap assemblies and pitch horns.

(4). Remove pitch plate and retention plates from fan hub.

B. Retention Plate and Pitch Plate Reassembly

(1). Position retention plates in fan hub.

NOTE: Install tension-torsion straps so that the cure date is in view when fan is assembled.

(2). Install pitch horn and strap assemblies (Ref. Strap and Pitch Horn Reassembly).

(3). Place pitch plate over retention plates within fan hub.

(4). Install fan blades (Ref. Anti-Torque Fan Blade Installation).

(5). Reinstall anti-torque fan in helicopter (Ref. Anti-Torque Fan Installation).

6. Support Shaft Replacement

(Ref. Figure 402) Remove and install the support shaft using the following procedures.

NOTE: When replacing pitch plate and/or support shaft bearings, do not use 900R bearings in the 500/600N helicopters.

A. Support Shaft Disassembly

(1). Remove anti-torque fan from helicopter (Ref. Anti-Torque Fan Removal).

(2). Remove fan pitch control tube (Ref. Sec. 67-20-30).

(3). Remove fan interconnect driveshaft (Ref. Sec. 63-15-30).

(4). Remove fan interconnect shaft coupling from support shaft (Ref. Sec. 63-15-30).

(5). Remove support shaft and fan hub housing from fan support assembly by removing four cotter pins, nuts, washers and bolts.

(6). Remove hub spacer from shaft.

(7). Remove bearing retainer from support housing.

(8). Press shaft and fan support bearing out of support housing.

NOTE: Removal of bearing seal at disassembly is not required unless seals need replacement.

(9). Remove bearing seal from support housing and bearing retainer.

(10). Press bearing off support shaft using removal ring.

B. Support Shaft Reassembly

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

Item	Nomenclature
CM111	Grease, aircraft
CM425	Sealing compound

(1). Install removal ring on support shaft until firmly seated against shoulder of support shaft.

(2). Install support bearing on support shaft.

(3). Install bearing seal in support housing and bearing retainer using sealant (CM425).

(4). Fill seal cavity with 3.3-4.0 CCs of grease (CM111).

ANTI-TORQUE FAN INSPECTION/CHECK

1. Anti-Torque Fan Inspection

Inspect the anti-torque fan for the following conditions:

(1). All components for cracks, nicks, corrosion or excessive wear.

(2). Tension-torsion straps for nicks or cuts in polyurethane coating. No exposed kevlar fibers allowed. Spools for cracks.

(3). Hub-to-blade bushings for cracks.

(4). Pitch horn for excessive wear (out-of-round condition).

(5). Counterweights on pitch horn for security. If loose, perform Pitch Horn Counterweight Set Screw Replacement.

NOTE: Access the forward counterweights through the fan inlet. Fan hub fairing must be removed for access (Ref. Sec. 53-30-30).

(6). Pitch plate bushing for excessive wear, grooves or cracking.

(7). Blades for cracks, nicks or impact damage.

(8). Inspect gap between fan blade and tip seal. Inspect gap between fan blade and hub (inboard end of the blade). If gap for any blade end exceeds the average gap of the other blades by more than 0.10 inch (2.54 mm), remove and inspect the tension-torsion strap for that blade.

2. Support Shaft Inspection

Inspect the support shaft and its associated components as follows:

NOTE: Ensure proper pitch plate and/or support shaft bearings are installed. 900R bearings are not to be used in the 500/600N helicopters.

(1). Support shaft for:

(a). Cracks; none allowed.

(b). Wear.

(c). Scoring; axial marks from bearing installation or removal.

(d). Damaged spines; none allowed.

(e). Corrosion and pitting.

(2). Fan support bearing for free movement of set.

(3). Fan support bearing retainer and housing for:

(a). Cracks; none allowed.

(b). Wear.

(c). Scoring; axial marks from bearing installation or removal.

(4). Bearing seals for condition.

(5). Hub spacer for cracks and wear.

3. Anti-Torque Fan Liner (Felt Metal Seal) Inspection

(1). Inspect for cracks and debonding of liner material.

(2). Inspect for cracks around the radius cutouts of fan support.

(3). If cracks are found, stop drill and inspect every 50 hours (Ref. Sec. 05-20-20).

NOTE: Cracks protruding into the Felt Metal Seal are unacceptable, replace seal (Ref. Anti-Torque Fan Liner (Felt Metal Seal) Replacement).

(4). Inspect aft P-seal for tears, deterioration and debonding.

4. Fan Blade Inspection (100-Hour)

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

Item	Nomenclature
CM437	Sealing compound

(1). Inspect polypropylene portion of fan blade for nicks, scratches, abrasions and bulges; pay particular attention to

leading edge and area around the pin near the outboard edge of blade.

(a). Nicks and abrasion pits that are less than 0.040 inch (1.016 mm) deep and 0.25 inch (6.35 mm) in diameter may be blended out. (No more than two such repairs can be made per blade.)

(b). Nicks, scratches and abrasion pits less than 0.020 inch (0.508 mm) and 1.5 inch (3.81 cm) long may be blended out. (Total length of all repairs not to exceed 2.0 inch (5.08 cm).)

(2). Any bulges or blisters over 0.10 inch (2.54 mm) long in area of pin near outboard end of blade are reason for blade rejection.

(3). Seal cracks up to 0.10 inch (2.54 mm), coming from area of pin with sealing compound (CM437).

(4). If any cracks larger than 0.10 inch (2.54 mm) are found, replace blade.

5. Fan Pitch Slider Inspection

(1). Inspect slider for dents, scratches, nicks, gouges and corrosion, none allowed.

(2). Inspect Karon coating on slider for condition.

(3). Measure across slider, minimum diameter is 0.805 in. (20.447 mm).

ANTI-TORQUE FAN REPAIRS

1. Anti-Torque Fan Liner (Felt Metal Seal) Replacement

(Ref. Figure 801)

A. Anti-Torque Fan Liner (Felt Metal Seal) Removal

(1). Remove tailboom (Ref Sec. 53-40-30).

(2). Disconnect safety wire and remove nut, lockwasher, 3 bolts, washers and pitch bearing retainer plate.

(3). Remove pitch bearing and inner pitch bearing retainer; remove pitch slider from pitch bearing housing (Ref. Sec. 67-20-30).

(4). Remove fan assembly (Ref. Anti-Torque Fan Replacement).

(5). Remove sealant around liner edges with plastic scraper.

(6). Remove four screws that secure the liner to the aircraft structure.

NOTE: Mark liner to aircraft structure to ensure proper clocking upon installation. If liner is not installed in same position, felt metal seal machining will be necessary for correct fan clearance.

(7). Carefully slide liner aft through support structure and fan support struts.

B. Anti-Torque Fan Liner (Felt Metal Seal) Installation

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

Item	Nomenclature
CM425	Sealing compound

(1). Install fan liner so that the larger cutouts fit around the fan support struts and the smaller cutouts fit around the rivets that secure the fan inlet fairing.

NOTE: On installation of liner assembly, peel shim laminates equally among the four shims to provide a tight fit without deforming the liner at screw holes and aircraft structure.

(2). Install four screws. Torque screws per standard aircraft practices.

CAUTION Do not install sealant in butt splices of liner until after felt-metal is turned/cut to correct clearance. Doing so will damage cutting tool and cause incorrect cutting radius to liner seal.

(3). Install sealant (CM425) in mating bores (cutouts) and around liner edges.

(4). After installing the fan liner and before installing the fan, trim liner felt metal seal (Ref. Anti-Torque Fan Liner (Felt Metal Seal) Machining). Refer to MD Helicopter Field Service Representative for additional information.

C. Anti-Torque Fan Liner (Felt Metal Seal) Machining

(Ref. Figure 801 and Figure 802)

Special Tools
(Ref. Section 91-00-00)

Item	Nomenclature
ST603	Tip seal cutter

NOTE:

- Do this procedure only after a new fan liner is installed.
- Felt metal material can cause FOD contamination.

(1). Apply masking tape and plastic sheet to fan duct and fan diffuser areas.

CAUTION Use only cutter and equipment supplied with (ST603) tip seal tool.

NOTE: Make sure (ST603) tip seal tool is clean before you install it.

(2). Install pin (5) and spacer (6) in fan support assembly.

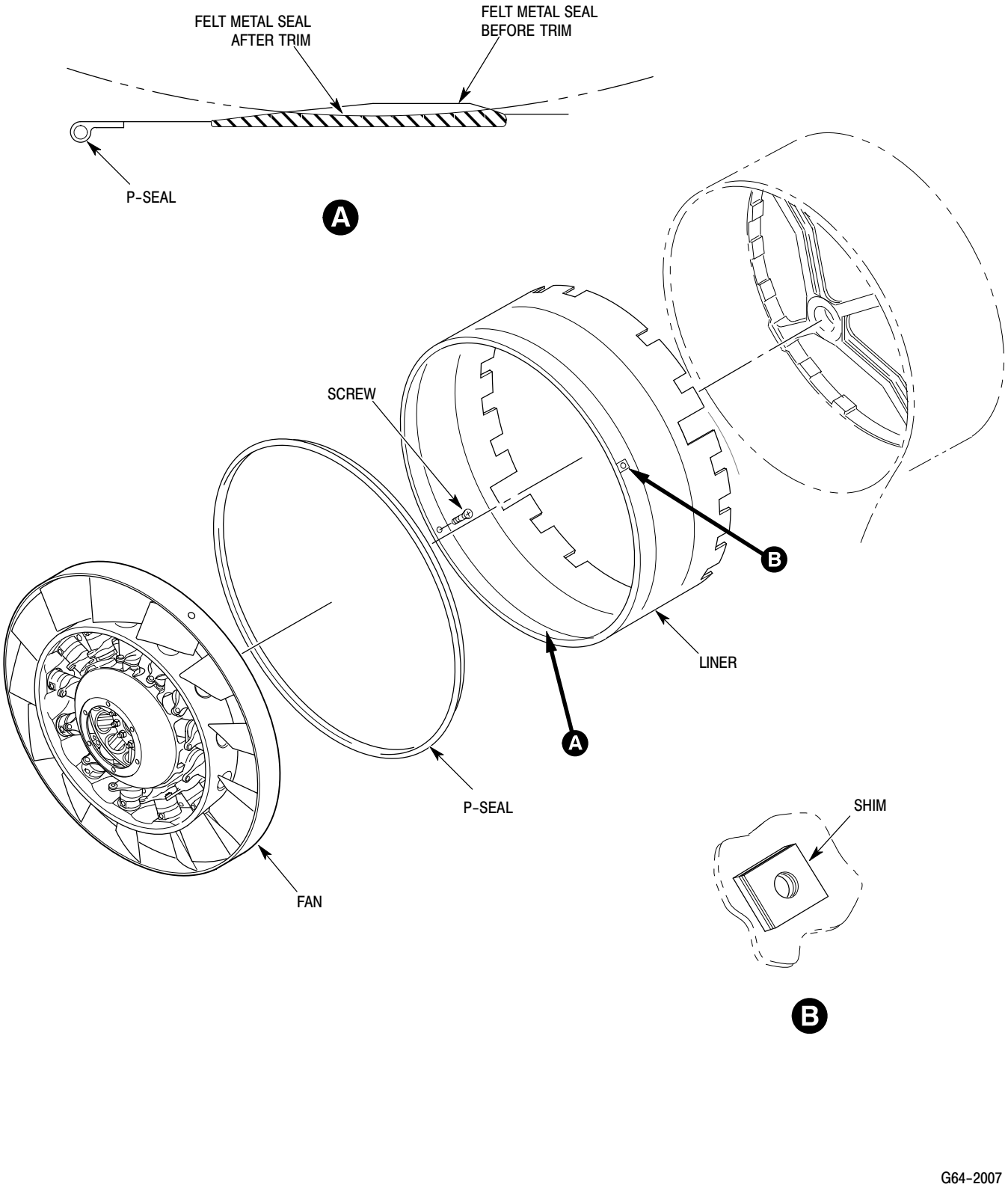
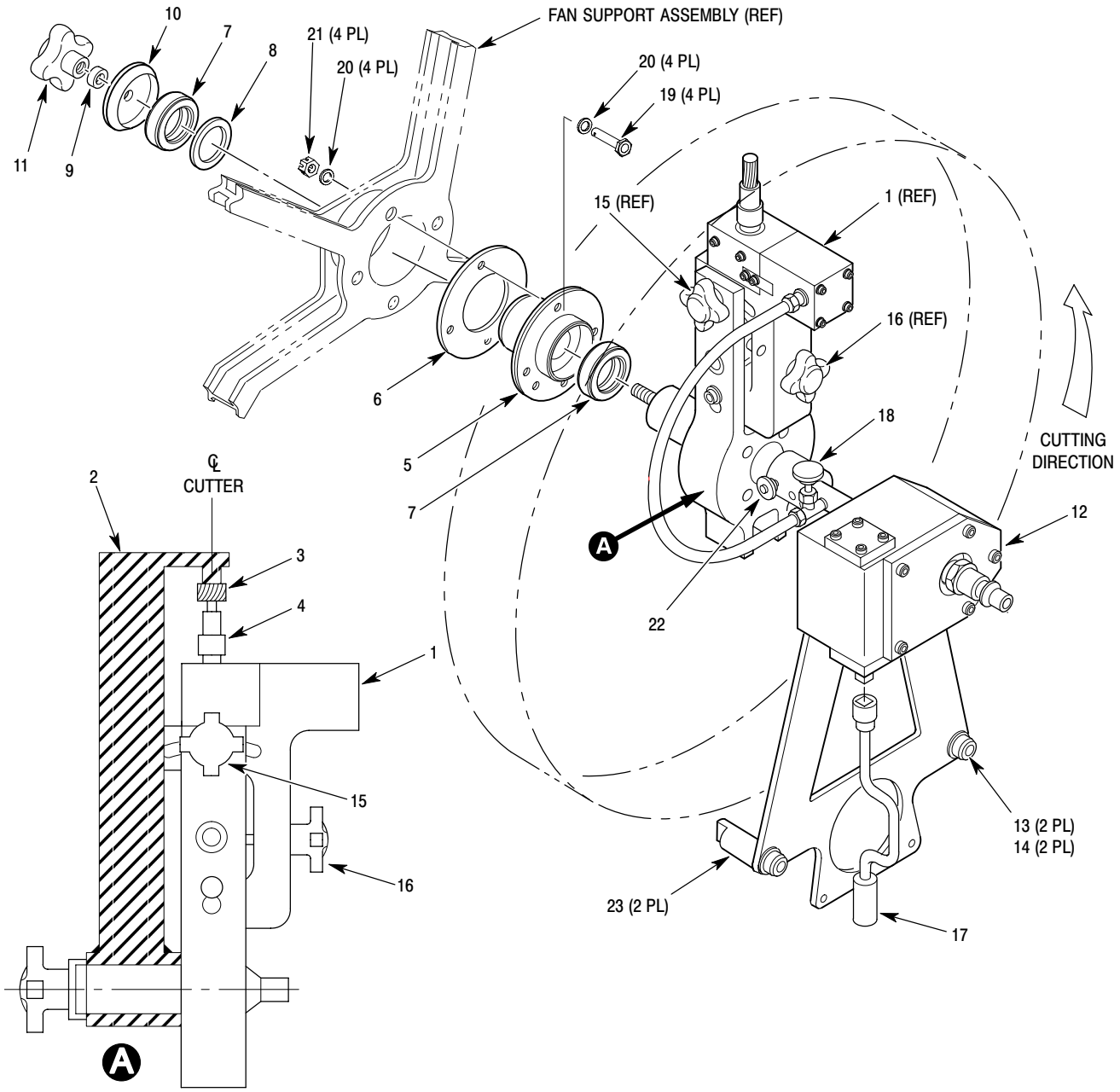


Figure 801. Anti–Torque Fan Liner (Felt Metal Seal)



CALIBRATION OF CUTTING TOOL HEIGHT

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1. FAN TIP SEAL TOOL (PART 1)
2. CALIBRATION ARM
3. CUTTER
4. MOTOR COLLET
5. PIN
6. SPACER
7. THRUST BEARING
8. SPACER
9. NYLON WASHER
10. THRUST BEARING RETAINER
11. THREADED KNOB
12. FAN TIP SEAL TOOL (PART 2)
13. CAP SCREW
14. WASHER
15. POSITION LOCK KNOB
16. ADJUSTMENT KNOB
17. SPEED HANDLE
18. AIR PRESSURE VALVE
19. BOLT
20. WASHER
21. NUT
22. BALL LOCK PIN
23. SPACER

Figure 802. Anti-Torque Fan Liner Felt Metal Seal Machining

(3). Install bolts (19), washers (20), and nuts (21). Torque nuts.

(4). Put cutter (3) in motor collet (4). Do not tighten collet.

(5). Apply a thin film of oil to inner side of pin (5) and outer side of tool (1) shaft.

(6). Put thrust bearing (7) on tool (1) shaft.

(7). Put tool (1) in pin (5) and push forward.

(8). Turn tool (1) by hand and adjust cutter (3) to highest point on fan liner. Tighten collet (4).

(9). Remove tool (1).

(10). Remove thrust bearing (7) from tool (1) shaft.

(11). Put calibration arm (2) on tool (1).

(12). Measure dimension between cutter (3) and stop on calibration arm (2).

(13). Loosen motor collet (4) and move cutter (3) out **0.040-0.050 in. (1.02-1.27 mm)** or until cutter touches stop on calibration arm (2). Tighten collet.

(14). Loosen position lock knob (15) and turn adjustment knob (16) until cutter (3) is at aft most position. Tighten position lock knob.

(15). Put thrust bearing (7) on tool (1) shaft.

(16). Put tool (1) in pin (5) and push forward.

(17). Install spacer (8), thrust bearing (7), thrust bearing retainer (10), nylon washer (9), and threaded knob (11). Tighten knob.

(18). Put tool (12) on tool (1) and install ball lock pin (22).

(19). Install cap screws (13), washers (14), and spacers (23). Torque cap screws.

(20). Make sure there is no radial or axial movement in tool (1).

(21). Lubricate tool motor, use pneumatic tool oil.

WARNING **Eye protection, a respirator, gloves, and protective clothing must be worn during fan liner machining.**

(22). Loosen position lock knob (15) and turn adjustment knob (16) to position cutter (3) for a cut of not more than one fourth width of cutter (3). Tighten lock knob.

(23). Connect speed handle (17) to tool (12).

(24). Connect pneumatic pressure source to tool (12).

(25). Turn valve (18) to adjust cutter (3) speed.

(26). Turn speed handle (17) and turn tool (1) counter-clockwise at a moderate to slow rate. Do not force cut.

(27). After one full turn, again loosen position lock knob (15) and turn adjustment knob (16) to position cutter (3) for a cut of not more than one fourth width of cutter (3). Tighten lock knob.

(28). Do step (27). again and again until fan liner is fully machined.

(29). Disconnect pneumatic pressure source to tool (12).

(30). Disconnect speed handle (17) from tool (12).

(31). Remove cap screws (13), washers (14), and spacers (23).

(32). Remove ball lock pin (22) and tool (12).

(33). Remove threaded knob (11), nylon washer (9), thrust bearing retainer (10), thrust bearing (7), and spacer (8).

(34). Remove tool (1).

(35). Remove thrust bearing (7) from tool (1) shaft.

NOTE: The following clearance may vary because of variations in blade length.

(36). Install fan assembly and check for a **0.10 in. (2.54 mm)** maximum clearance between fan blade ends and felt metal seal.

(37). In step (13). did cutter touch stop on calibration arm?

(a). No, go to step (11).

(b). Yes, go to step (38).

(38). Remove nuts (21), washers (20), and bolts (19).

(39). Remove pin (5) and spacer (6) from fan support assembly.

(40). Clean fan duct and diffuser areas and remove masking tape and plastic sheet.

NOTE: The anti-torque control system must be re-rigged immediately after removal or replacement of control rods, linkages and components or if helicopter operation reveals a rigging deficiency.

(41). Install fan assembly (Ref. Anti-Torque Fan Replacement).

(42). Install interconnect driveshaft (Ref. Sec. 63-15-30).

(43). Install fan pitch control rod (Ref. Sec. 67-20-30).

(44). Install pitch slider and inner pitch bearing retainer (Ref. Sec. 67-20-30).

(45). Install tailboom (Ref. Sec. 53-40-30).

2. Anti–Torque Fan Bearing Regreasing

Special Tools (Ref. Section 91–00–00)	
Item	Nomenclature
ST614	Fan bearing regreasing tool

(Ref. Figure 803 and Figure 804) The following procedure is for the regreasing of the 500N5364 and 500N7120 bearings.

Consumable Materials (Ref. Section 91–00–00)	
Item	Nomenclature
CM111	Grease, aircraft

NOTE:

- Ensure proper pitch plate and shaft support bearings are installed. 900R bearings are not to be used in the 500/600N helicopters.
- Refer to Figure 804 for instructions on the manufacture of a regreasing tool.

(1). Remove bearings from fan assembly (Ref. Support Shaft Disassembly).

(2). Carefully remove both seals from bearings (seals will be reused at reassembly).

(3). Inspect seals for damage; no damage is allowed.

(4). Install bearings between regreasing tools with a 4 inch (10 cm) 10–24 threaded bolt, washers and wing nut.

NOTE: The following procedure provides 100% grease fill. Normal grease fill is 30 to 50%. Excess grease will extrude past seals for several hours of operation until the proper level is met.

(5). Purge bearing with grease (CM111) until clean grease protrudes from all four holes in back of tool.

(6). Remove regreasing tool.

(7). Hand spin bearing to purge excess grease.

NOTE: Ensure seals are serviceable. If new seals are required, seals and bearings must come from the same vendor.

(8). Carefully install seals.

(9). Reinstall bearings (Ref. Support Shaft Reassembly).

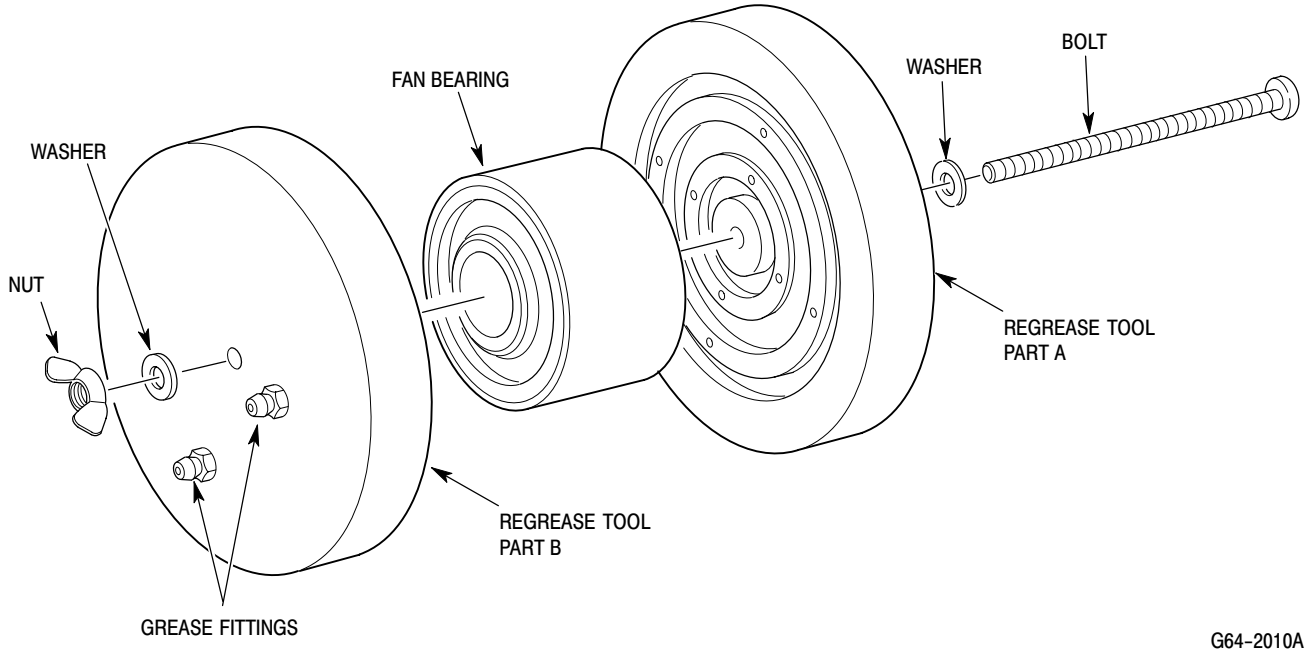
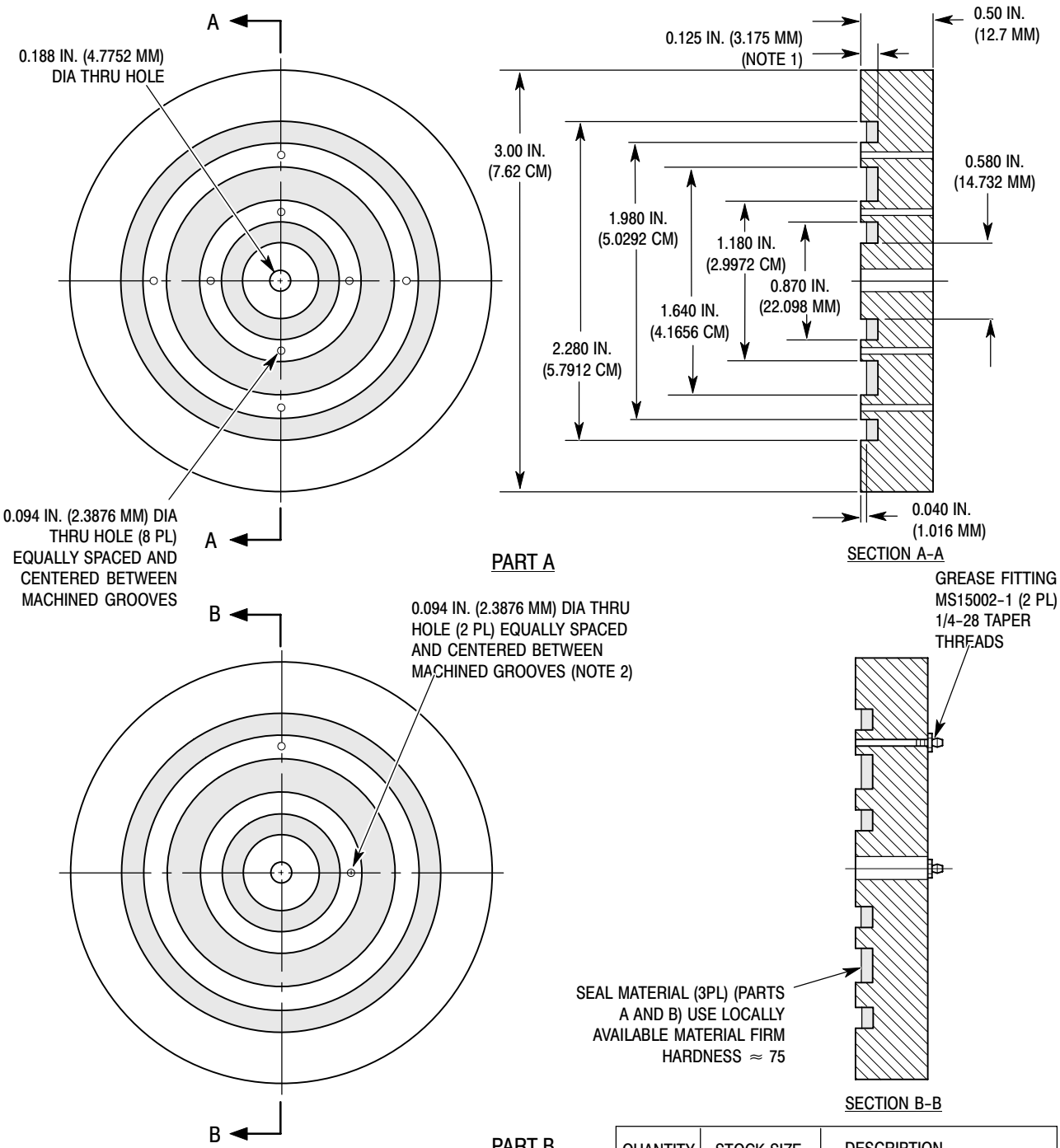


Figure 803. Fan Bearing Regreasing Procedure



QUANTITY	STOCK SIZE	DESCRIPTION
1	4 x 4 x .50	PLATE
1	4 x 4 x .50	PLATE
1	AN23-64	BOLT
2	AN960D10L	WASHER
1	AN315-3R	NUT
2	MS15002-1	GREASE FITTING
1	M6855/2	RUBBER

NOTES:

1. DIMENSION MAY VARY DEPENDING ON SEAL MATERIAL THICKNESS AVAILABLE.
2. ALL OTHER DIMENSIONS SAME AS PART A.

MATERIALS:

1. 6061-T651 ALUMINUM PER QQ-A-250/11 OR EQUIVALENT.
2. SURFACE FINISH 125 RMS.
3. BREAK SHARP EDGES 0.002-0.015 IN. (0.0508-0.381 MM).
4. CHEMICAL FILM TREAT PER MIL-C-5541.
5. DIMENSION TOLERANCE ±0.010 IN. (±0.254 MM).
6. GROOVE DIAMETERS TO BE CONCENTRIC TO 0.188 IN. 4.7752 MM) DIA WITHIN 0.002 IN. (0.0508 MM).

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Figure 804. Fan Bearing Regreasing Tool (ST614)

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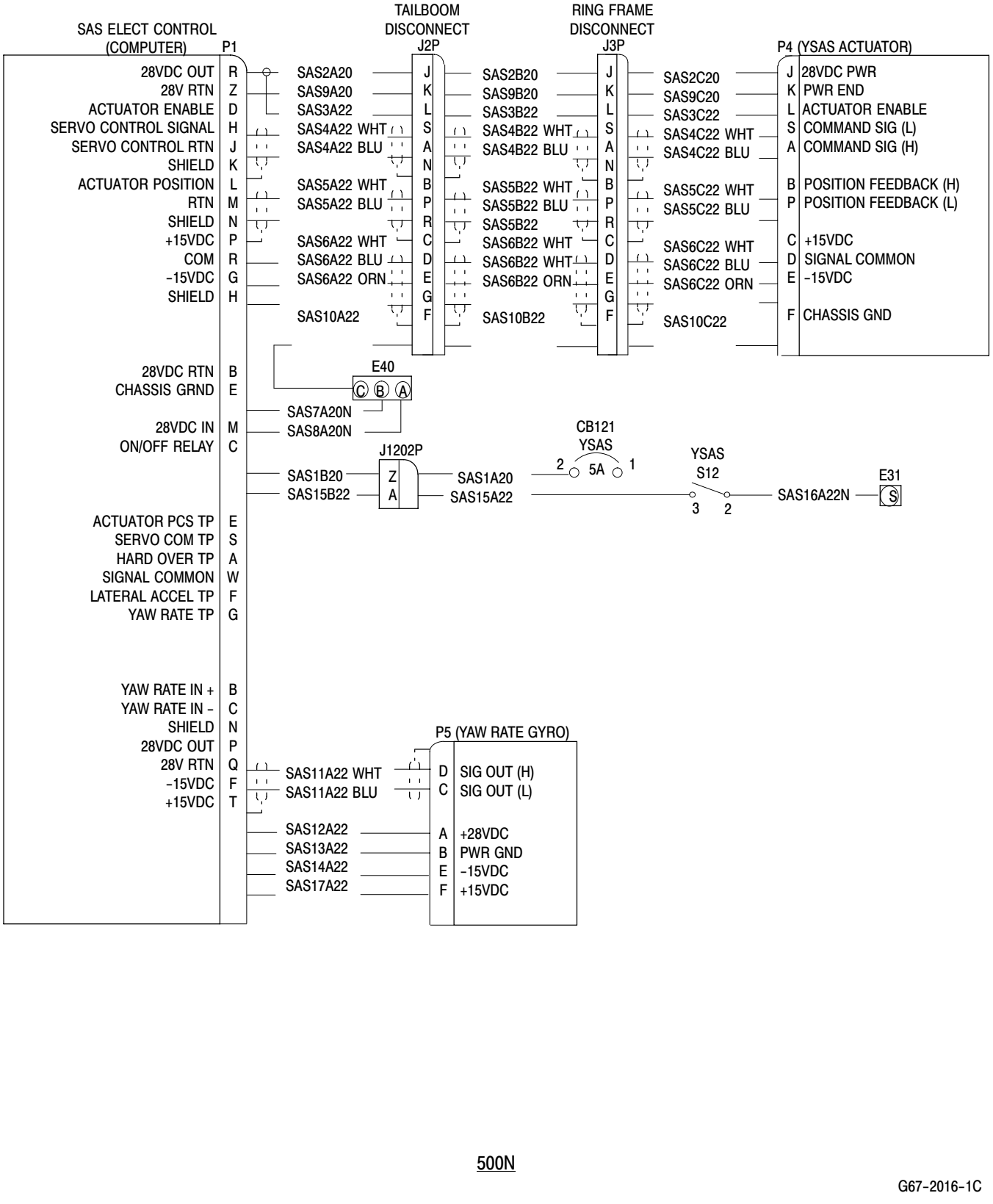

Figure 101. YSAS Electrical Diagram (Sheet 1 of 2)

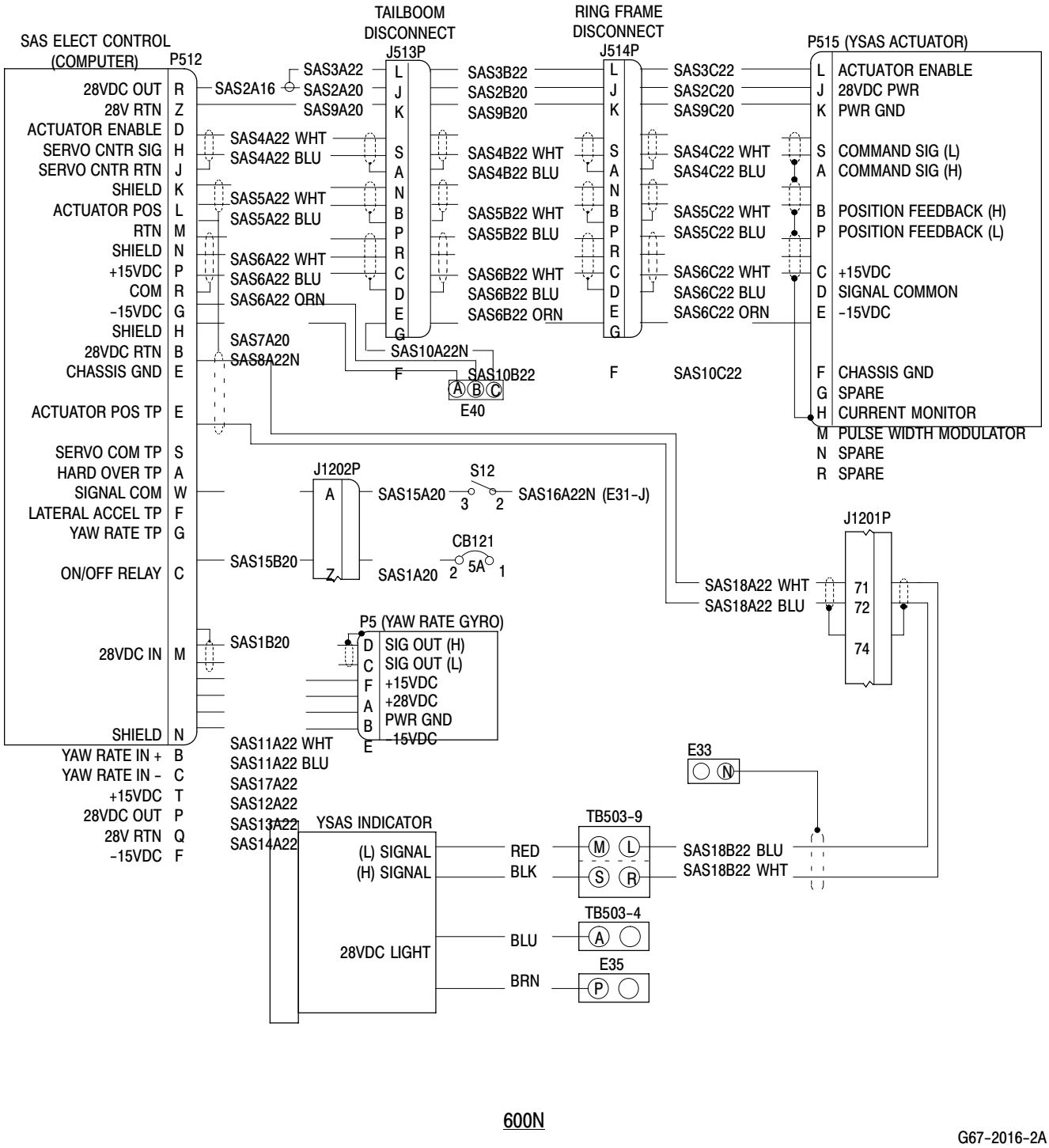

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Figure 101. YSAS Electrical Diagram (Sheet 2 of 2)

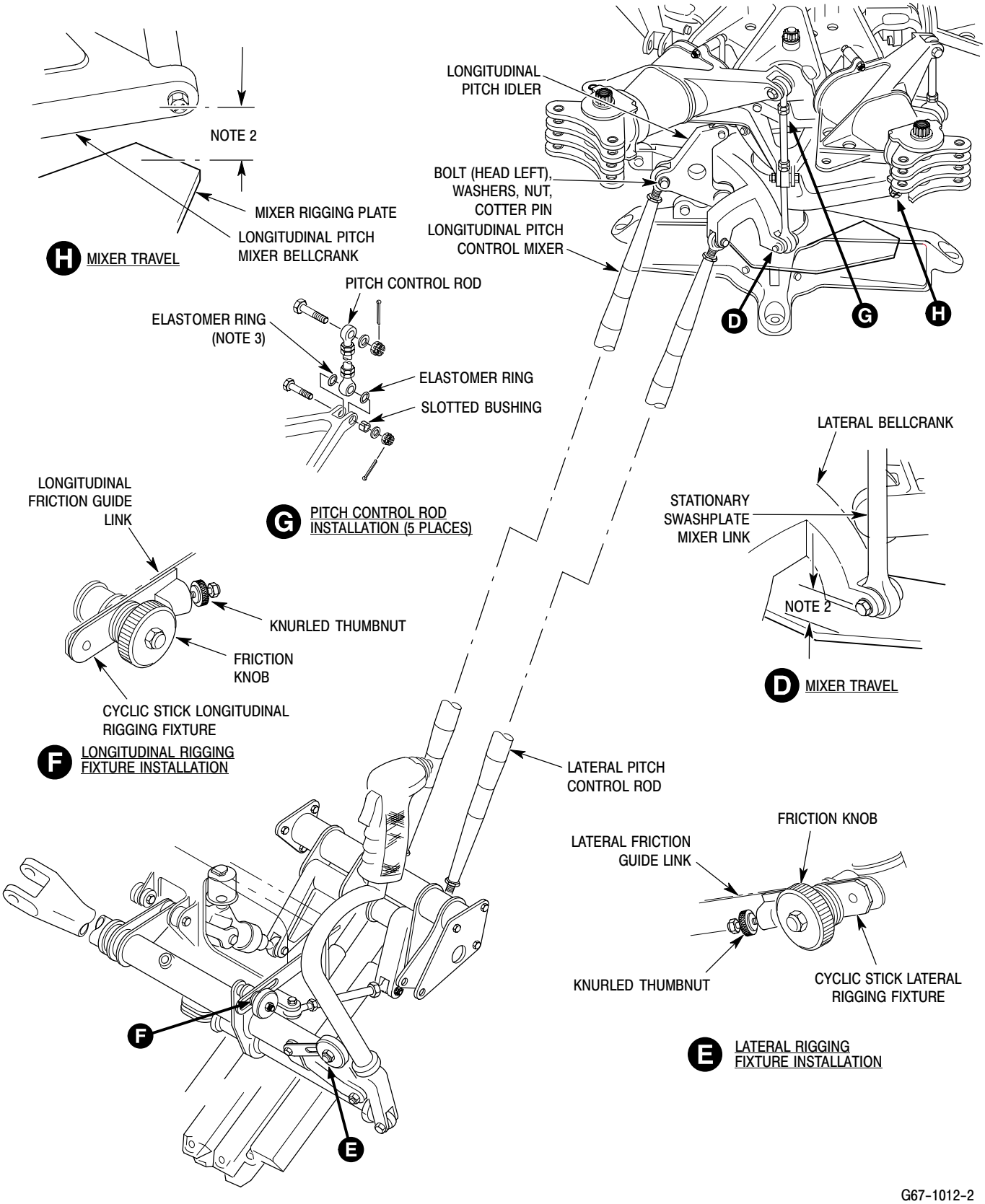
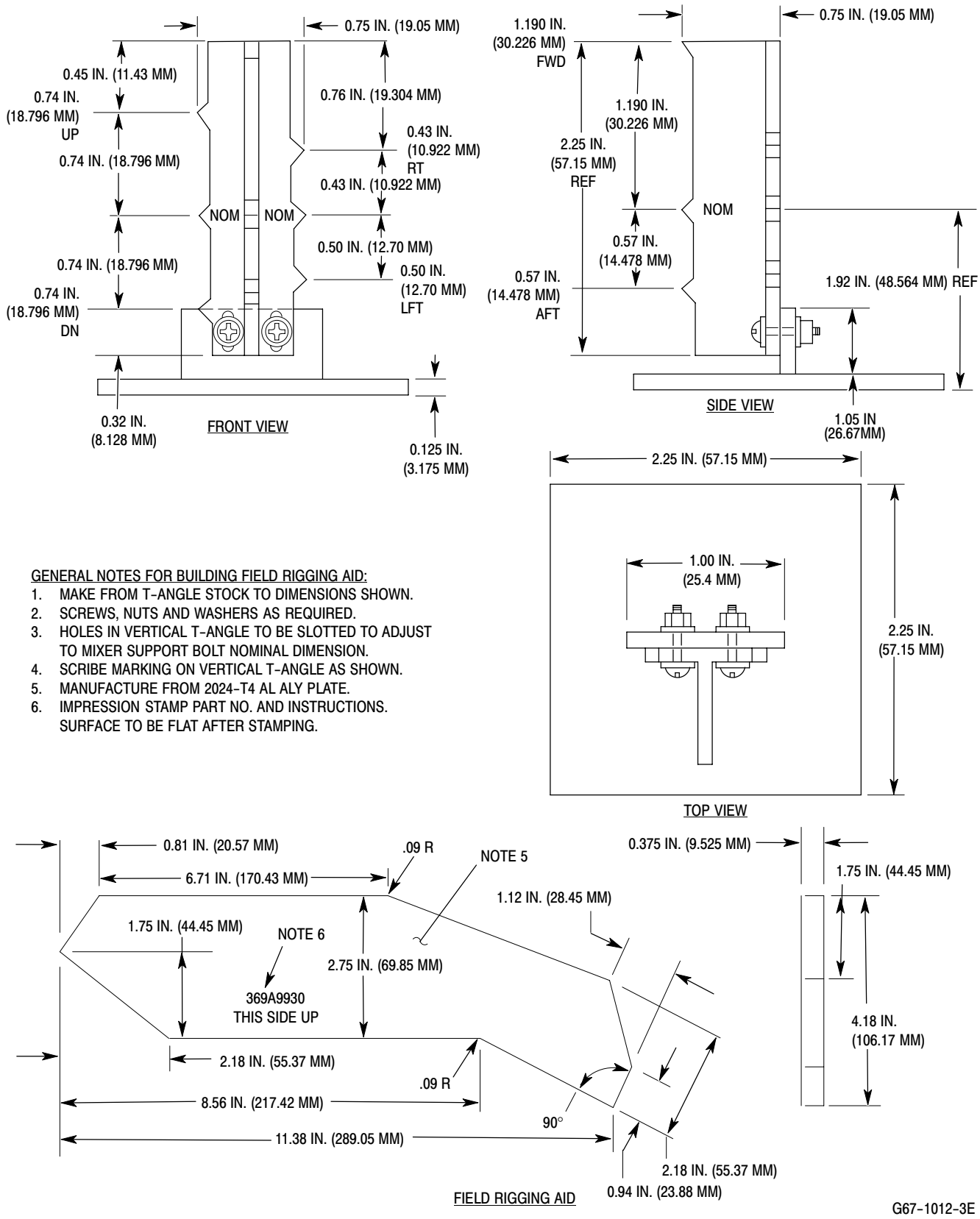


Figure 501. Main Rotor Control System Rigging (369D/E/FF – 500N) (Sheet 2 of 3)



GENERAL NOTES FOR BUILDING FIELD RIGGING AID:

1. MAKE FROM T-ANGLE STOCK TO DIMENSIONS SHOWN.
2. SCREWS, NUTS AND WASHERS AS REQUIRED.
3. HOLES IN VERTICAL T-ANGLE TO BE SLOTTED TO ADJUST TO MIXER SUPPORT BOLT NOMINAL DIMENSION.
4. SCRIBE MARKING ON VERTICAL T-ANGLE AS SHOWN.
5. MANUFACTURE FROM 2024-T4 AL ALY PLATE.
6. IMPRESSION STAMP PART NO. AND INSTRUCTIONS. SURFACE TO BE FLAT AFTER STAMPING.

Figure 501. Main Rotor Control System Rigging (369D/E/FF – 500N) (Sheet 3 of 3)

(2). Remove bellcrank from pedal bracket.

(3). Remove nut and washer of two bushing assemblies that secure left pedal arm and control rod fitting to torque tube.

(4). Carefully remove bushing bolt and temporarily reinstall washer and nut on bolt.

(5). Slide pedal bracket and pedal arms off end of torque tube.

NOTE:

- Do not remove two teflon-lined bushings from right pedal arm unless replacement is required.
- Do not remove two stop bolts, jam nuts on stop bolts or bearings from pedal bracket unless replacement is required.

(6). Slide torque tube bracket and control rod fitting off torque tube.

14. Anti-Torque Pedal Repair

Consumable Materials (Ref. Section 91-00-00)	
Item	Nomenclature
CM425	Sealing compound
CM431	Sealing, locking and retaining compound

(1). Replace parts that are cracked or have elongated attachment holes.

CAUTION Do not attempt to straighten bent torque tube or pedal link.

(2). Replace unserviceable pedal covers. Apply sealing compound (CM425) to approximately 30 percent of upper and lower edge surfaces that contact pedal. Cure according to container instructions.

(3). Replace complete pedal link if cracked or contains unserviceable bearings; bearings are not replaceable.

(4). Replace unserviceable bearings in mounting brackets or pedal link bellcrank.

(5). Install replacement with grade A locking compound (CM431).

CAUTION Right pedal arm bushings are glass-filled phenolic. Do not cock bushings during replacement; ensure bushing is fully seated in arm bore. Keep tools from contact with bushing liners to avoid fraying.

(6). Replace bearings in right pedal arm when teflon-reinforced liner is galled or frayed. Pull bushing to remove; press to install.

(7). Remove corrosion from pedal brackets (Ref. Sec. 20-40-00 and CSP-A-3, Corrosion Control Manual).

15. Anti-Torque Pedal Reassembly

(Ref. Figure 403)

(1). When reassembling components, check for correct matchmark identification.

(2). If previously removed, thread jamnut on each of two stop bolts and install two stop bolts into threaded inserts of pedal brackets.

(3). Slide torque tube bracket and control rod fitting onto torque tube.

(4). Locate pedal bracket and pedal arms for correct position on torque tube; slide bracket and arms onto torque tube.

(5). Fasten left pedal arm and control rod fitting to torque tube with adjustable bushing assemblies.

(6). Install bushing bolt so shank at bolt-head end protrudes at least 0.002 inch (0.051 mm).

(7). Torque nut to **50 - 80 inch-pounds (5.65 - 9.04 Nm) plus drag torque**; do not allow bolt to turn.

(8). Ensure each end of bushing assembly shank protrudes a minimum of 0.002 inch (0.051 mm). If not, loosen and repeat above steps.

(9). Ensure slotted bushing is in place; then attach bellcrank to pedal bracket with bolt, two washers, nut and cotter pin.

(10). Ensure slotted bushings are in place; then fasten each link to bellcrank with bolt, two washers, nut and cotter pin.

(11). Ensure slotted bushings are in place; then fasten each link in pedal arm lugs with bolt, two washers, nut and cotter pin.

(12). Ensure outboard pedals clear windows by a minimum of 0.20 inch (5.08 mm) with 20 pounds (9.07 kg) of force applied.

16. YSAS Actuator Regrease Procedure

A. YSAS Actuator Disassembly

(Ref. Figure 801)

CAUTION Do not attempt to loosen or tighten nut by grasping actuator housing, damage to spline housing can occur.

(1). Cut and remove lockwire from lockwasher and nut.

(2). Hold hex end of output shaft and loosen nut.

(3). Remove rod end, nut and lockwasher.

(4). Record output shaft orientation by marking the notch on the connector side of the shaft with a pencil.

(5). Measure endplay of the actuator as follows:

(a). Push the output shaft in towards the actuator housing by applying a load of 20 -100 lbs (9.07 - 45.36 kg).

(b). Using a depth gage, measure and record dimension "C".

(c). Screw the rod end into the output shaft a few turns.

(d). Pull on the output shaft by applying a load of 20 -100 lbs (9.07 - 45.36 kg).

(e). Unscrew and remove the rod end without changing dimension "C".

NOTE: If the variation in dimension "C" exceeds 0.013 inch (0.3302 mm), the actuator should be returned to the manufacturer for repair rather than regrease.

(f). Remeasure and record dimension "C".

(6). Cut lockwire and remove the four screws that hold the seal housing and splined housing.

NOTE: It may be necessary to grasp the cylindrical portion of the seal housing or splined housing with a rubber-tipped clamping tool to loosen the housing because of primer applied to the screws at assembly.

(7). If there is an inspection seal at the housing joint, remove enough of the label so that it cannot get pinched between the housings when the actuator is re-assembled. Leave some of the label on the actuator to aid in re-assembly. If there is no inspection seal, use pieces of tape.

NOTE: Belleville spring, spacer and shims (if installed) are installed between the seal housing and splined housing.

(8). Remove seal housing and splined housing.

(9). Note the order of assembly of these parts.

(10). Measure and record the thickness of the spacer and the total thickness of the shims (if installed) to avoid confusion with the spacer and shims on the other side of the splined housing.

NOTE: The teflon washer attached to the end of the LVDT core is a close fit to the bore through the LVDT housing, it may be necessary to carefully tug a little to fully remove the shaft.

(11). Unscrew and remove the output shaft. This shaft has the LVDT core and associated hardware attached to it; Do not unscrew the nylon screw or the LVDT core.

(12). Note the orientation of the belleville spring, spacer and shims (if installed). Measure and record the thickness of the spacer and shims.

CAUTION Do not use any cleaning solvents. Damage to the motor bearings and the molybdenum disulfide finish on the acme nut and spline surfaces may occur.

(13). Wipe off old grease from all parts using lint-free cloth.

(14). Using cotton swabs, remove grease from acme nut area. Be sure to reach into the cavity just beyond the acme nut threads to remove grease deposits.

(15). Use the acme screw to remove grease from the acme nut threads.

(a). Run screw in and out, then wipe threads clean.

(b). Repeat above step until no more grease appears on screw threads.

B. YSAS Actuator Regrease and Reassembly

(Ref. Figure 801)

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

Item	Nomenclature
CM109	Molybdenum disulfide powder lubricant
CM111	Grease, aircraft
CM127	Grease, YSAS Actuator
CM318	Primer
CM731	Lockwire CRES

NOTE: Use YSAS actuator grease (CM127) or mix aircraft grease (CM111) and molybdenum disulfide powder (CM109) to regrease the actuator.

(1). Prior to applying new grease, re-assemble the output shaft with attached hardware (splined housing, belleville spring, spacer and shims (if installed)) to the actuator to avoid confusion at re-assembly.

(2). Remove and weigh output shaft with LVDT core and associated hardware attached; Record weight.

(3). Adjust scale up 2.5 grams.

NOTE: If you mix grease, only use Mobil Grease 28 which meets MIL-G-81322.

(4). If necessary, mix 95% aircraft grease (CM111) with 5% molybdenum disulfide powder (CM109) by weight.

(5). Apply special grease (CM127) to acme screw threads until scale is balanced again.

(6). Evenly distribute grease around the acme screw threads to form a fairly even cylinder in order to fit through the belleville spring without scraping off too much grease.

(7). With belleville spring, spacer and shims (if installed) in place within end bore in motor housing, carefully assemble greased output shaft to actuator.

(a). Screw in the shaft until the leading edge of the spline on the shaft is about flush with the end of the motor housing and oriented so that the splined housing can be put on in it's proper orientation.

(8). Apply grease (CM127) to splined surfaces of splined housing until grooves are completely full. Install splined housing as originally oriented.

(9). Apply film of grease (CM127) to smallest inside diameter of seal housing.

(10). With belleville spring, spacer and shims (if installed) in place within end bore of seal housing, slide seal housing into position over output shaft as originally oriented.

(11). Replace four screws which hold down seal housing; Use only NAS1352-04H8P screws.

(a). Install screws with wet primer (CM318).

(b). Torque screws to **9 inch-pounds (1.02 Nm)**.

(c). Using lockwire (CM731), safety screws.

(12). Re-install rod end, nut and lockwasher with rod end face (surface "A") oriented at 90° ±2° with respect to surface "B". Torque nut to **170 - 200 inch-pounds (19.21 - 22.60 Nm)**.

(13). Using lockwire (CM731), safety nut to lockwasher, washer may be oriented with lockwire end up or down.

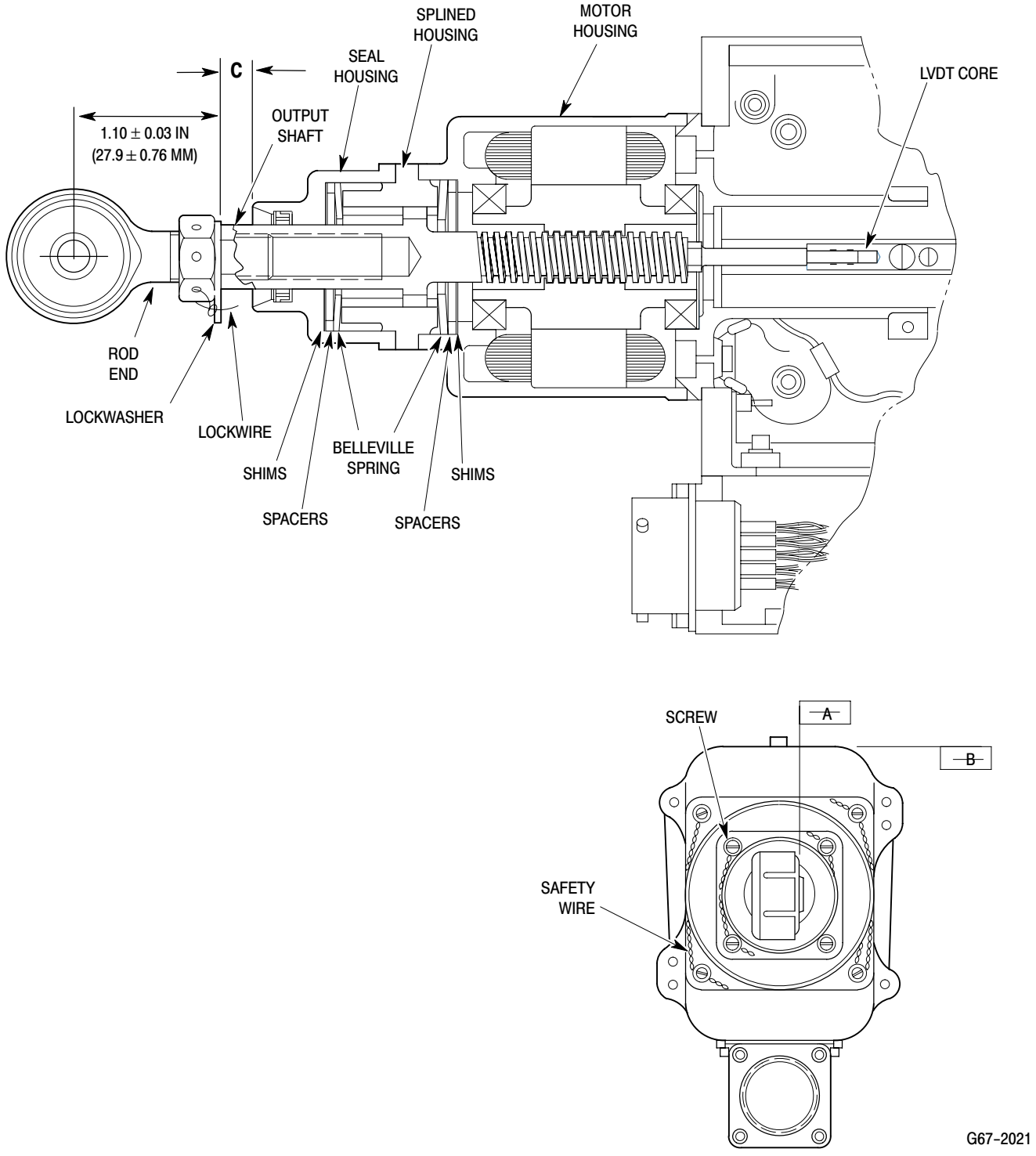


Figure 801. YSAS Actuator (Cross-Section View)

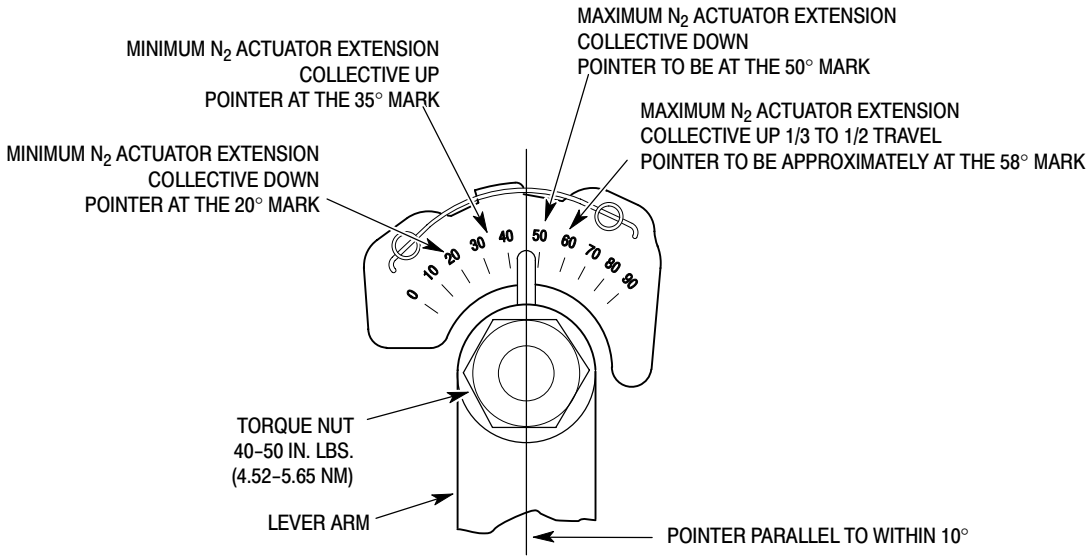


Figure 207. Power Turbine Governor Adjustments (250–C30 Engine)

8. Governor Controls Final Check and Adjustment (250–C20B, –C20R/2)

(1). Have an assistant move collective through full range of travel while inspecting all movable linkage for clearance with adjacent parts. Check that control rod, N_2 actuator and override link bearings are not jammed when linkage is at extreme control positions.

(2). Start and operate engine at idle with main rotor blades in flat pitch per Pilot's Flight Manual.

(3). Decrease N_2 trim to minimum.

(4). Throttle up to maximum rpm.

(5). Observe N_2 tachometer pointer for (98% or less rpm: 369D/E) (94% or less: 500N) when rotor rpm pointer is superimposed on N_2 pointer and N_1 tachometer pointer is stabilized.

(6). Check for the following engine power out (EPO) indications:

(a). Engine–out flashing light.

(b). Audio signal in headset.

(c). Horn; sounds when N_2 pointer on dual indicator is stable.

(7). With collective stick down, increase N_2 trim to (104% to 105% rpm: 369D/E) (103% to 104% rpm: 500N). Observe N_2 tachometer pointer when rotor rpm pointer is superimposed on N_2 pointer and N_1 tachometer pointer is stabilized.

(8). Without decreasing N_2 trim, rotate pilot's throttle to ground idle.

NOTE: Perform a deceleration time check per PFM after rigging and testing power turbine controls. Refer to Allison Operation and Maintenance Manual for adjustment procedures if deceleration time is less than allowable minimum.

(9). Shut down engine per Pilot's Flight Manual.

WARNING **Make all engine compartment control rod adjustments with engine shut down.**

(10). Mark N_2 lever position on governor quadrant.

(11). Connect external electric power.

(12). With collective at bottom stop, beep N_2 trim to maximum rpm.

(13). Adjust governor lever control rod (105% N_2 maximum: 369D/E) (104% N_2 maximum: 500N).

(14). Start engine. With main rotor blades in flat pitch, beep N_2 trim to (102% rpm: 369D/E) (100% rpm: 500N). Lift off and hover.

(15). Observe N_2 tachometer pointer when pointer of N_1 tachometer is stabilized. N_2 pointer indication, that is, droop compensation, should be (1/2% to 1% rpm: 369 D/E) (1% to 2% rpm: 500N) above indication in previous step.

(16). Land and shut down engine.

(17). If droop compensation occurred as required, no further adjustments are required.

(18). If droop compensation did not occur per step (15)., check and re–rig power turbine and gas producer linkage systems as required.

(19). Where N_1 and N_2 linkage are correctly adjusted, additional adjustment may be made to droop compensation adjustment fork; as follows:

NOTE: Three to five turns of droop compensation fork may be necessary to change droop compensation approximately 0.5% rpm.

(a). Shorten droop compensation adjustment fork to increase compensation.

(b). Lengthen fork extension to decrease compensation.

(c). Align fork with override link rod–end before tightening fork jamnut.

(20). Move collective through full travel after adjustment and check for clearance

between movable linkage and adjacent parts.

(21). When full power is demanded in flight and high N_1 and TOT operating range cannot be reached, gas producer fuel control maximum throttle stop may require adjustment. Refer to Allison Operation and Maintenance Manual for adjustment procedure.

9. Governor Controls Final Check and Adjustment (250-C30)

(1). Have an assistant move collective through full range of travel while inspecting all movable linkage for clearance with adjacent parts. Check that control rod, N_2 actuator and override link bearings are not jammed when linkage is at extreme control positions.

(2). Start and operate engine at idle with main rotor blades in flat pitch per Pilot's Flight Manual.

(3). Rotate pilots throttle counterclockwise up to maximum rpm.

(4). Decrease N_2 trim to minimum.

(5). Observe N_2 tachometer pointer for 94% or less rpm and N_1 tachometer is stabilized.

(6). With collective stick down, increase N_2 trim to maximum.

(7). Observe N_2 tachometer pointer for 103% to 104% rpm and N_1 tachometer pointer is stabilized.

WARNING **Make all engine compartment control rod adjustments with engine shut down.**

(8). Stop engine. Adjust length of governor control lever rod until N_2 trim is within limits specified in steps (5). and (7). above. Adjust one rod end not more than one turn at a time.

(9). Restart engine. With main rotor blades in flat pitch, actuate N_2 trim for 100 percent, lift-off and hover.

(10). Observe N_2 tachometer pointer when pointer of N_1 tachometer is stabilized. N_2 pointer indication (droop compensation) should be 1 to 2 percent above N_2 setting in step (9).

(11). Land and shut down engine.

NOTE: If droop compensation occurs as required in (10). above, skip steps (12). and (13). below.

(12). If droop compensation does not occur as required in step (10). above, recheck entire power turbine governor (N_2 RPM) control linkage rigging and gas producer (N_1 fuel control) linkage adjustment.

CAUTION Any change to initial droop compensation fork length may result in interference between N_2 trim actuator case and fork threaded end. Move collective through full travel after adjustment and check for clearance between movable linkage and adjacent parts.

(13). If N_1 and N_2 linkage are correctly installed, an additional adjustment may be made at droop compensation adjustment fork. Shorten droop compensation adjustment fork to increase compensation. Lengthen fork extension to decrease compensation. Align fork with override link rod end before tightening fork jam nut. Three to five turns of droop compensation fork may be necessary to change droop compensation fork approximately 0.5 percent.

NOTE: Perform a deceleration time check per PFM after rigging and testing power turbine controls. Refer to Allison Operation and Maintenance Manual for adjustment procedures if deceleration time is less than allowable minimum.

10. Governor Controls Replacement

(Ref. Figure 208)

(1). Remove and replace control rods, bellcranks and supports as required, except as follows:

WARNING **Only high temperature all metal self-locking nuts are to be used for attaching control idler support to engine gearcase accessory pad.**

NOTE: Remove droop control override link, N_2 trim actuator, and Sta. 72.00 bellcrank from airframe as a unit.

(2). Leave Sta. 72.00 bellcrank attached to N_2 trim actuator and remove as a unit.

(3). Disconnect the bonding jumper and electrical connector from the actuator.

(4). Disconnect the actuator from Sta. 68 bellcrank.

(5). Disconnect Sta. 72 bellcrank from the fuselage-routed control rod end.

(6). Remove the pivot bolt that attaches Sta. 72 bellcrank to structure rib and controls support bracket; remove actuator and bellcrank.

(7). Disconnect the trim actuator from Sta. 72 bellcrank. Use care to keep sleeve bushings with bellcrank.

(8). Check replacement actuator for a maximum extended length of 5.44-5.50 inches (13.82-13.97 cm) measured between bolt hole centers. Test actuator for proper operation (Ref. N_2 Trim Actuator Test).

(9). Assemble original or replacement trim actuator to original or replacement Sta. 72 bellcrank with a bolt, two washers, nut and new cotter pin.

(10). Check that both sleeve bushings are in place in Sta. 68 bellcrank arm before connecting the actuator; then install assembled unit in controls support bracket and connect linkage as shown in Figure 208.

(11). The sleeve bushings in Sta. 68 bellcrank arm must rotate freely, without any binding, after the actuator is attached and the connecting hardware is tightened.

(12). Connect replacement droop control override link to collective torque tube.

(13). Push on rod end and check that the link assembly plunger head is free to slide back and forth in the link housing end fitting.

(14). Connect rod end to droop compensation fork; the rod end should align with the fork.

(15). Connect the bonding jumper and electrical connector to the actuator.

NOTE: Replacement trim actuator may have a tab or use a bonding strap/clamp for connection of the bonding jumper.

(16). Rig power turbine governor controls if any linkage components have been removed and replaced.

NOTE: Perform a deceleration time check per PFM after rigging and testing power turbine controls. Refer to Allison Operation and Maintenance Manual for adjustment procedures if deceleration time is less than allowable minimum.

11. Control Rod Inspection

(Ref. Figure 208)

(1). Inspect rod end bearings for binding and excessive wear, 0.040 inch (1.013 mm) maximum axial play).

(2). Inspect control rod for surface damage and evidence of bending.

(3). When necessary, perform straightness check on control rods that appear bent or bowed. Total length of gas producer control rods (excluding rod ends) must be straight within the following tolerances, with straightness variation limited to maximum of 0.010 inch (0.254 mm) in each foot of length.

(a). Fuselage-routed control rods: 0.050 inch (1.27 mm).

Table 3. Special Tools (Cont.)

Item No.	Part No.	Nomenclature	Function	Vendor (Table 4)
ST508	369D29936 369A7300-ATP-1	Collective bungee installation tool (369D/E/FF - 500N) (600N)	Remove bungee installation tool. Dismantle bungee assembly.	
ST509	Not used at this time			
ST510	369D29985	Bungee spring compression tool rod and channel (369D/E/FF - 500N)	Compress collective bungee.	
ST511	369D29910-32501	Test fixture	Shop aid for rigging main rotor controls.	
		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	ATP1-500N5365-1 -TD	Tip seal cutting fixture	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.	
ST614	500N5364-ATP1	Regreasing tool, fan bearing	Regreasing of the 500N5364 and 500N7120 fan bearings.	

Table 3. Special Tools (Cont.)

Item No.	Part No.	Nomenclature	Function	Vendor (Table 4)
		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 old FRDH101 new	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.	
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