

MDHI MODEL HELICOPTERS

Illustrated Parts List and Initial Installation Instructions

Upgraded Transmission Conversion

Model 369D, 369E, 369FF, 500N Helicopters



MD Helicopters, Inc.
5000 East McDowell Road
Mesa, Arizona 85215-9797

NOTE: Please complete a Change Request if discrepancies are found in manual during use.

MDHS COMMERCIAL TECHNICAL PUBLICATIONS Publications Change Request	
This manual has been prepared and distributed by the Technical Publications Department. Periodic revision of this manual will be made to incorporate the latest information. If, in the opinion of the reader, any information has been omitted or requires clarification, please direct your comments to this office using this form (or a duplicate), which can be mailed or Faxed to (602) 891-5989. An endeavor will be made to include the information in future changes.	
Company: _____	<input type="checkbox"/> Check If this is a Change of Address
Name: _____	<input type="checkbox"/> Check for more cards
Address: _____	
Phone: _____ Fax: _____	
Book Identification CSP-_____	Change Number / Date _____
ATA / Section Number _____	Page Number(s) _____
Figure Number(s) _____	Helicopter Model(s) _____
Index Number(s) _____	Serial Number(s) _____
<u>Remarks / recommendations:</u>	

MDHS COMMERCIAL TECHNICAL PUBLICATIONS Revision/Change Customer Feedback	
Company: _____	Date Mailing Received: _____
Name: _____	CSP-102
Address: _____	OPTIONAL EQUIPMENT
	MANUAL
	Issued: 2 April 1996
Phone: _____ Fax: _____	Revision No. 1: 1 May 1996
Were problems encountered inserting this revision/change package, <input type="checkbox"/> Yes <input type="checkbox"/> No (if YES, check box(s) to indicate problem area)	
<input type="checkbox"/> Removal & Replace page, <input type="checkbox"/> List of Effective Pages, <input type="checkbox"/> Table of Contents, <input type="checkbox"/> Index, <input type="checkbox"/> Pages not collated properly <input type="checkbox"/> Print quality poor, <input type="checkbox"/> other _____	
Total number of errors found: _____	
General Evaluation of this Technical Manual	
Technical Content - Complete, concise and accurate information	Superior <input type="checkbox"/> Acceptable <input type="checkbox"/> Unacceptable <input type="checkbox"/>
Reproduction Quality - Clear and legible print quality	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Format Well Planned - Clear, logical, easy to use	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Timeliness of Updates - Revisions received promptly	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Competitive Assessment	
Competition - If similar manual provided by other manufacturers, how does McDonnell Douglas Helicopter Systems (MDHS) compare?	MDHS to Bell <input type="checkbox"/> Better <input type="checkbox"/> Same <input type="checkbox"/> Worse <input type="checkbox"/> N/A MDHS to Eurocopter <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> MDHS to Sikorsky <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> MDHS to _____ <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Issued: 2 April 1996

Original



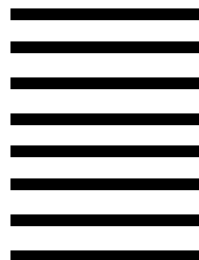
NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 1448 MESA AZ

POSTAGE WILL BE PAID BY ADDRESSEE

COMMERCIAL TECHNICAL PUBLICATIONS
MCDONNELL DOUGLAS HELICOPTER SYSTEMS
5000 E MCDOWELL RD
MESA AZ 85215-9946



Cut Here



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 1448 MESA AZ

POSTAGE WILL BE PAID BY ADDRESSEE

COMMERCIAL TECHNICAL PUBLICATIONS
MCDONNELL DOUGLAS HELICOPTER SYSTEMS
5000 E MCDOWELL RD
MESA AZ 85215-9946



Cut Here



NOTE: Please complete a Change Request if discrepancies are found in manual during use.

MDHS COMMERCIAL TECHNICAL PUBLICATIONS Publications Change Request	
This manual has been prepared and distributed by the Technical Publications Department. Periodic revision of this manual will be made to incorporate the latest information. If, in the opinion of the reader, any information has been omitted or requires clarification, please direct your comments to this office using this form (or a duplicate), which can be mailed or Faxed to (602) 891-5989. An endeavor will be made to include the information in future changes.	
Company: _____	<input type="checkbox"/> Check If this is a Change of Address
Name: _____	<input type="checkbox"/> Check for more cards
Address: _____	
Phone: _____ Fax: _____	
Book Identification CSP-_____	Change Number / Date _____
ATA / Section Number _____	Page Number(s) _____
Figure Number(s) _____	Helicopter Model(s) _____
Index Number(s) _____	Serial Number(s) _____
<u>Remarks / recommendations:</u>	

MDHS COMMERCIAL TECHNICAL PUBLICATIONS Revision/Change Customer Feedback	
Company: _____	Date Mailing Received: _____
Name: _____	CSP-102
Address: _____	OPTIONAL EQUIPMENT MANUAL
	Issued: 2 April 1996
Phone: _____ Fax: _____	Revision No. 1: 1 May 1996
Were problems encountered inserting this revision/change package, <input type="checkbox"/> Yes <input type="checkbox"/> No (if YES, check box(s) to indicate problem area)	
<input type="checkbox"/> Removal & Replace page, <input type="checkbox"/> List of Effective Pages, <input type="checkbox"/> Table of Contents, <input type="checkbox"/> Index, <input type="checkbox"/> Pages not collated properly <input type="checkbox"/> Print quality poor, <input type="checkbox"/> other _____	
Total number of errors found: _____	
General Evaluation of this Technical Manual	
Technical Content - Complete, concise and accurate information	Superior <input type="checkbox"/> Acceptable <input type="checkbox"/> Unacceptable <input type="checkbox"/>
Reproduction Quality - Clear and legible print quality	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Format Well Planned - Clear, logical, easy to use	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Timeliness of Updates - Revisions received promptly	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Competitive Assessment	
Competition - If similar manual provided by other manufacturers, how does McDonnell Douglas Helicopter Systems (MDHS) compare?	MDHS to Bell <input type="checkbox"/> Better <input type="checkbox"/> Same <input type="checkbox"/> Worse <input type="checkbox"/> N/A MDHS to Eurocopter <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> MDHS to Sikorsky <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> MDHS to _____ <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Issued: 2 April 1996

Original

**AIR MAIL
PAR AVION**

IBRS/CCRI No. 634



NE PAS AFFRANCHIR

NO POSTAGE
NECESSARY
IF MAILED
TO THE
UNITED STATES**INTERNATIONAL BUSINESS REPLY MAIL RESPONSE PAYEE**

PERMIT NO. 1148 MESA AZ

POSTAGE WILL BE PAID BY ADDRESSEE

COMMERCIAL TECHNICAL PUBLICATIONS
MCDONNELL DOUGLAS HELICOPTER SYSTEMS
5000 E MCDOWELL RD
MESA AZ 85215-9947
UNITED STATES OF AMERICA



Cut Here

**AIR MAIL
PAR AVION**

IBRS/CCRI No. 634



NE PAS AFFRANCHIR

NO POSTAGE
NECESSARY
IF MAILED
TO THE
UNITED STATES**INTERNATIONAL BUSINESS REPLY MAIL RESPONSE PAYEE**

PERMIT NO. 1448 MESA AZ

POSTAGE WILL BE PAID BY ADDRESSEE

COMMERCIAL TECHNICAL PUBLICATIONS
MCDONNELL DOUGLAS HELICOPTER SYSTEMS
5000 E MCDOWELL RD
MESA AZ 85215-9947
UNITED STATES OF AMERICA



Cut Here

***MCDONNELL DOUGLAS
HELICOPTER SYSTEMS***

RECORD OF TEMPORARY REVISIONS

MANUAL TITLE: CSP-102 MAINTENANCE MANUAL

[illegible]

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGE PAGES, DESTROY SUPERSEDED PAGES

* The asterisk indicates pages Changed, Added or Deleted by the Current Change.

Date of issue for original and change pages are:

Original April 2, 1996

Revision 1 April 1, 1996

<u>Page</u>	<u>Revision</u>	<u>Page</u>	<u>Revision</u>
*Title	Revision 1	SECTION 1	
CR-1A	N/A	1-1	Original
CR-2B	N/A	*1-2 thru 1-10	Revision 1
LOEP		SECTION 2	
TR	Original	2-1 thru 2-3	Original
*A/(B blank)	Revision 1	*2-4 thru 2-6	Revision 1
TOC		2-7 and 2-8	Original
i/(ii blank)	Original	*2-9	Revision 1
FIGURES		2-10 and 2-11	Original
*iii/(iv blank)	Revision 1	*2-12 thru 2-14	Revision 1
FOREWORD		2-15 thru 2-25	Original
F-1/(F-2 blank)	Original	*2-26 thru 2-28	Revision 1

TABLE OF CONTENTS

Para	Title	Page	Para	Title	Page
Foreword					
Description		F-1	2-2.	Serial Number Applicability	2-1
F-1.	Purpose and Contents of this Manual	F-1	2-3.	Reference Data	2-1
F-2.	Applicability	F-1	2-4.	Initial Preparation	2-1
F-3.	Component Mandatory Replacement	F-1	2-5.	Equipment Removal	2-1
F-4.	Organization of Contents	F-1	2-6.	Canted Station 124.00 Modification ...	2-4
F-5.	Related Publications	F-1	2-9.	Aft Mast Base Drain Relocation	2-7
F-6.	Literature Changes and Revisions	F-1	2-10.	Canted Station 78.50 Modification	2-8
Section 1			2-17.	Convenience Panel and Heater Duct Modification	2-10
Illustrated Parts List		1-1	2-22.	Baffle Assembly Modification	2-14
1-1.	Scope and Contents	1-1	2-23.	Main Transmission Build-Up	2-15
1-2.	Group Assembly Parts List	1-1	2-24.	Rotor Brake Caliper Installation	2-17
1-3.	Illustrations	1-1	2-25.	Main Transmission Installation	2-19
Section 2			2-26.	Oil Cooler Blower Installation	2-21
Maintenance Instructions		2-1	2-27.	369F5450 Overrunning Clutch Installation	2-23
2-1.	Scope	2-1	2-28.	Aircraft Reassembly	2-25
			2-29.	Expendable Materials	2-27

LIST OF FIGURES

Figure	Title	Page
Section 1		
Figure 1-1.	Modification Kit Installation Airframe Structure Upgrade Transmission (Sheet 1 of 3)	1-2
Figure 1-1.	Modification Kit Installation Airframe Structure Upgrade Transmission (Sheet 2 of 3)	1-3
Figure 1-1.	Modification Kit Installation Airframe Structure Upgrade Transmission (Sheet 3 of 3)	1-4
Figure 1-2.	Upgraded Main Rotor Driveline Modification Kit (Sheet 1 of 2)	1-7
Figure 1-2.	Upgraded Main Rotor Driveline Modification Kit (Sheet 2 of 2)	1-8
Section 2		
Figure 2-1.	Mast Support Structure (Sheet 1 of 2)	2-2
Figure 2-1.	Mast Support Structure (Sheet 2 of 2)	2-3
Figure 2-2.	Canted Station 124.00 Frame Modification (Sheet 1 of 2)	2-4
Figure 2-2.	Canted Station 124.00 Frame Modification (Sheet 2 of 2)	2-5
Figure 2-3.	Aft Mast Base Pan Drain Modification and Relocation	2-7
Figure 2-4.	Canted Station 78.50 Frame Modification (Sheet 1 of 2)	2-8
Figure 2-4.	Canted Station 78.50 Frame Modification (Sheet 2 of 2)	2-9
Figure 2-5.	Convenience Panel Modification	2-11
Figure 2-6.	Heater Duct Installation (Sheet 1 of 2)	2-12
Figure 2-6.	Heater Duct Installation (Sheet 2 of 2)	2-13
Figure 2-7.	369D26541 Baffle Assembly Modification	2-14
Figure 2-8.	Main Transmission Build-Up	2-16
Figure 2-9.	Rotor Brake Caliper Installation	2-18
Figure 2-10.	Main Transmission Installation (Sheet 1 of 2)	2-19
Figure 2-10.	Main Transmission Installation (Sheet 2 of 2)	2-20
Figure 2-11.	Oil Cooler Blower Installation	2-22
Figure 2-12.	369F5450 Overrunning Clutch Installation	2-24
Figure 2-13.	369F5510 Main Rotor Drive Shaft Installation	2-25
Figure 2-14.	Main Transmission Drive Shaft Runout Check	2-26
Figure 2-15.	Baffle Assembly Modification	2-27

SECTION 1

ILLUSTRATED PARTS LIST

1-1. Scope and Contents

This illustrated parts list provides, by means of text (parts list) and companion illustrations, a complete parts definition of the 369F5100 transmission conversion and applies to the Model 369D, 369E, 369FF and 500N helicopters manufactured by McDonnell Douglas Helicopter Systems, Mesa , AZ.

NOTE

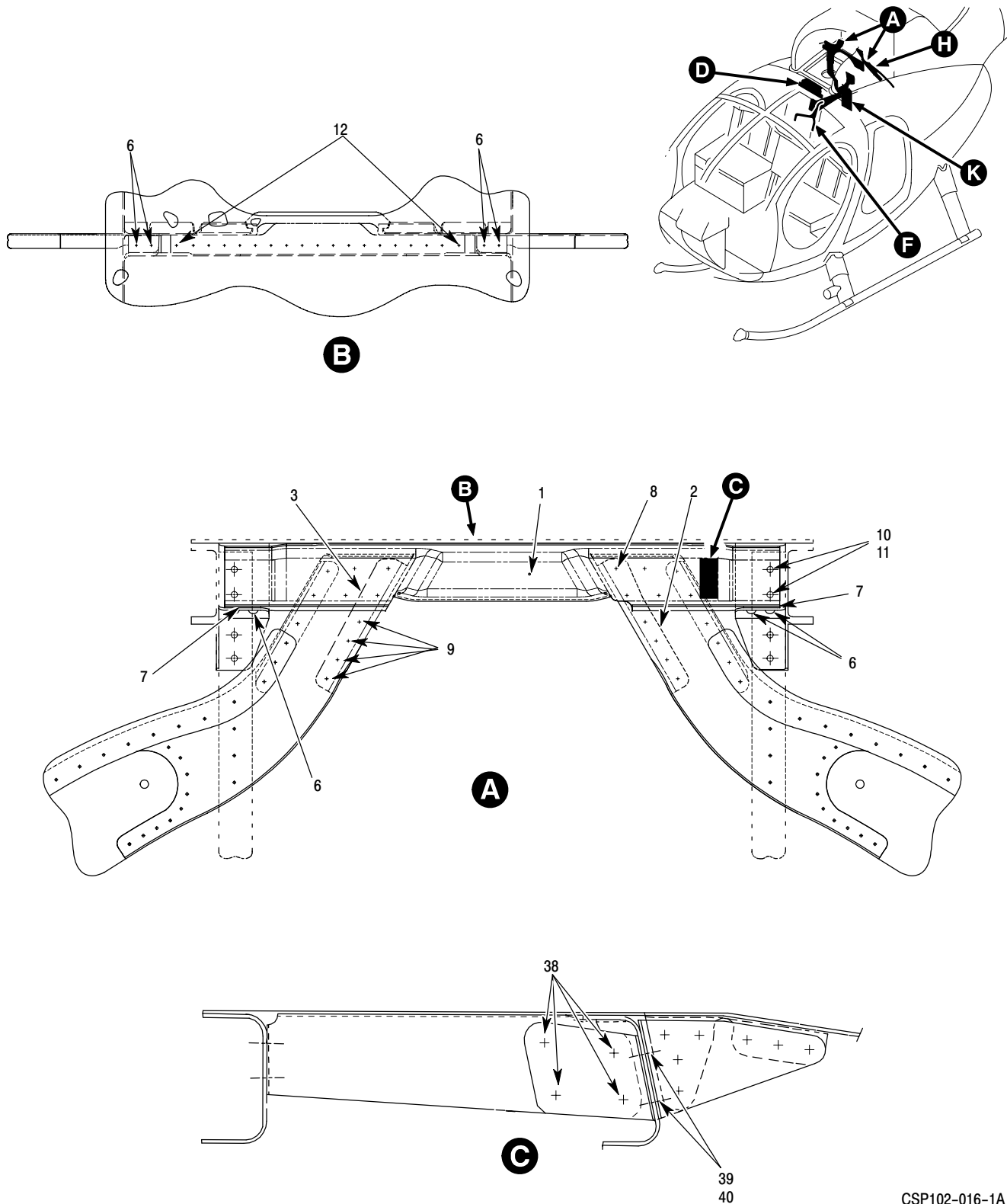
The illustrated parts list is organized and presented in the same manner as the 369D/E/FF - 500N Illustrated Parts Catalog (CSP-IPC-4). For information on use, refer to CSP-IPC-4.

1-2. Group Assembly Parts List

The following information is provided to aid the user, by means of text and detailed illustrations, for parts procurement only and shall not be used for any other purpose. This IPC should not be used for maintenance purposes.

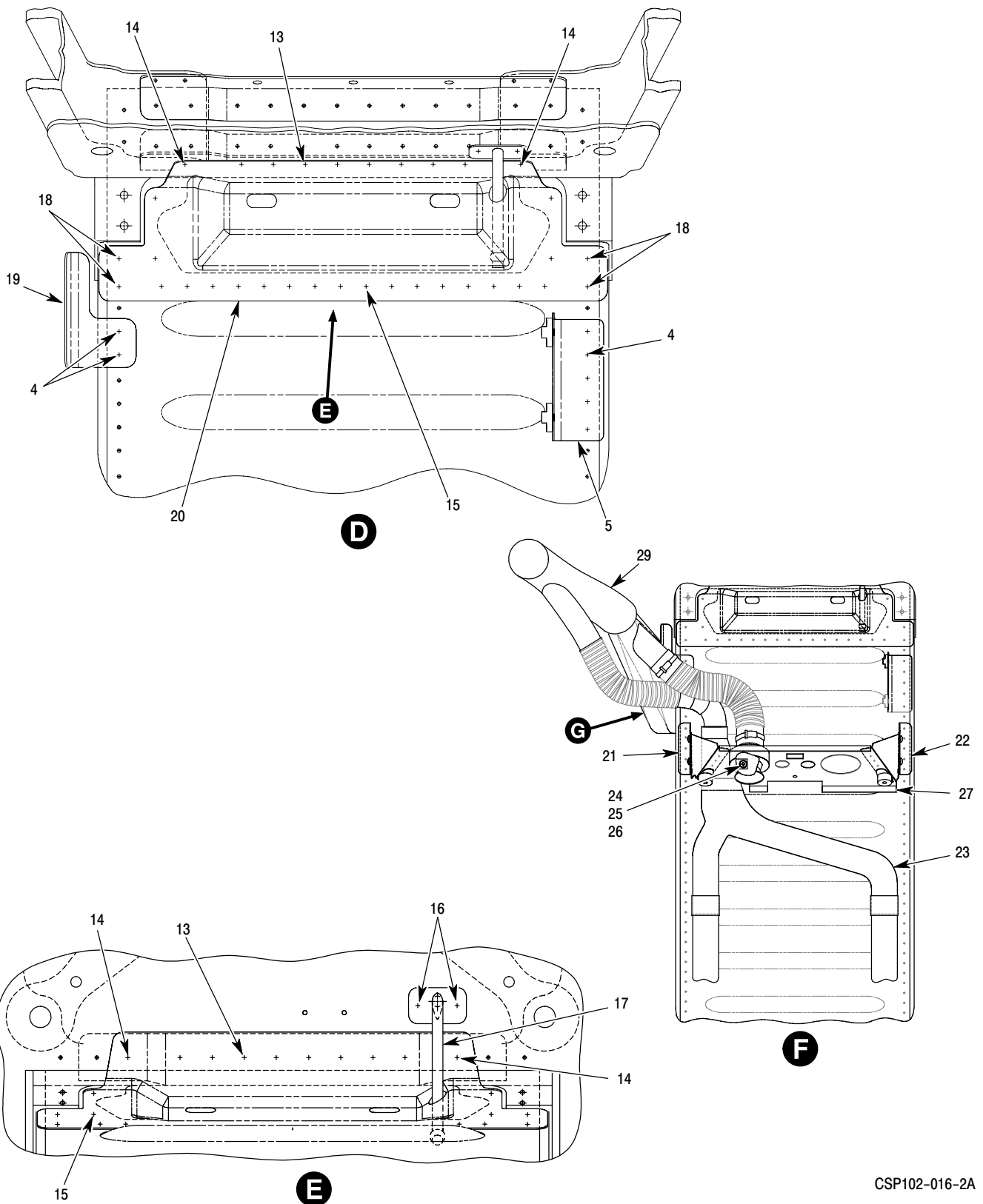
1-3. Illustrations

Illustrations are provided for each group assembly parts list. Each illustration is exploded to the extent necessary to show parts relationship for the complete transmission conversion.



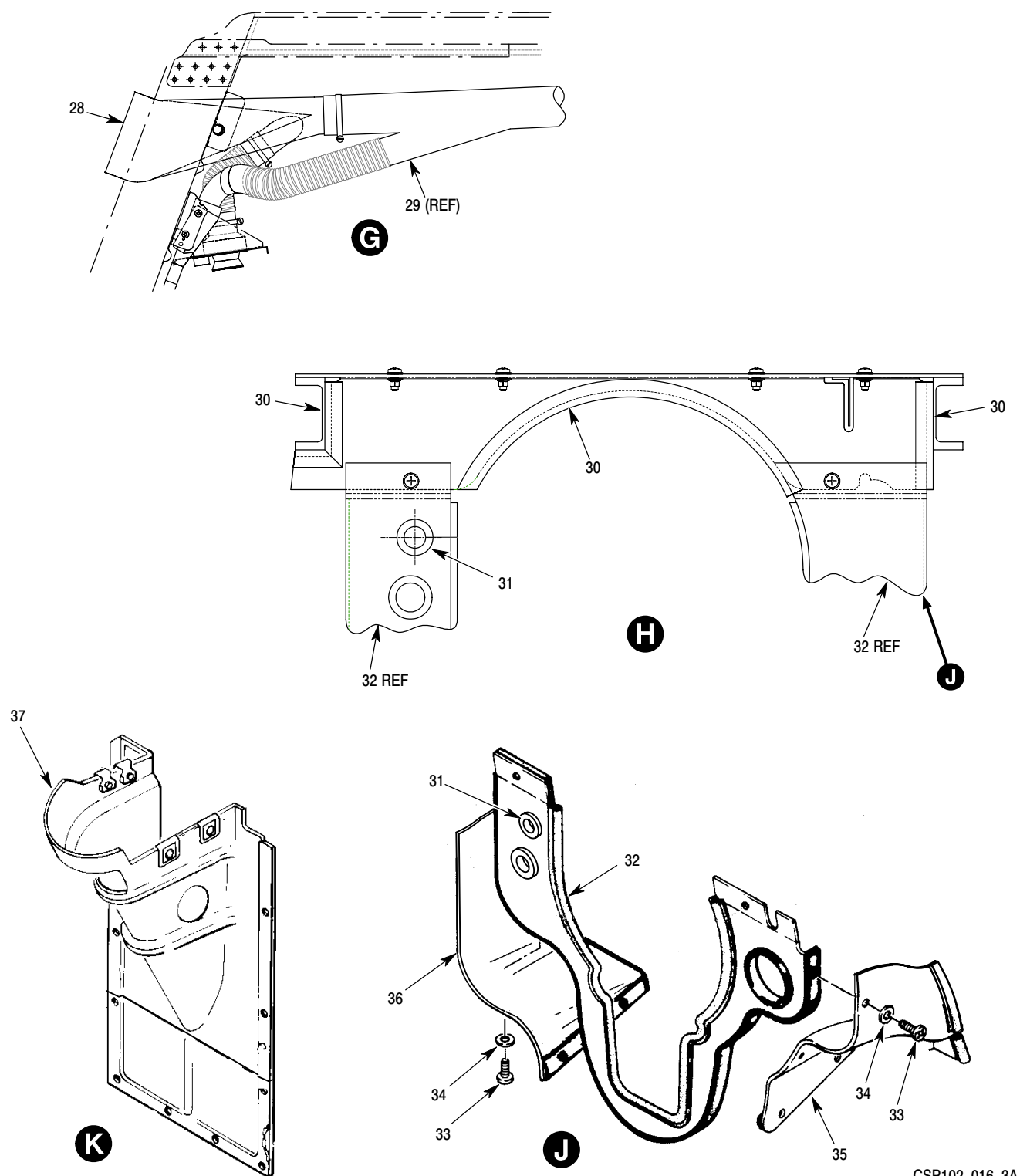
CSP102-016-1A

Figure 1-1. Modification Kit Installation
Airframe Structure Upgrade Transmission
(Sheet 1 of 3)



CSP102-016-2A

Figure 1-1. Modification Kit Installation
Airframe Structure Upgrade Transmission
(Sheet 2 of 3)

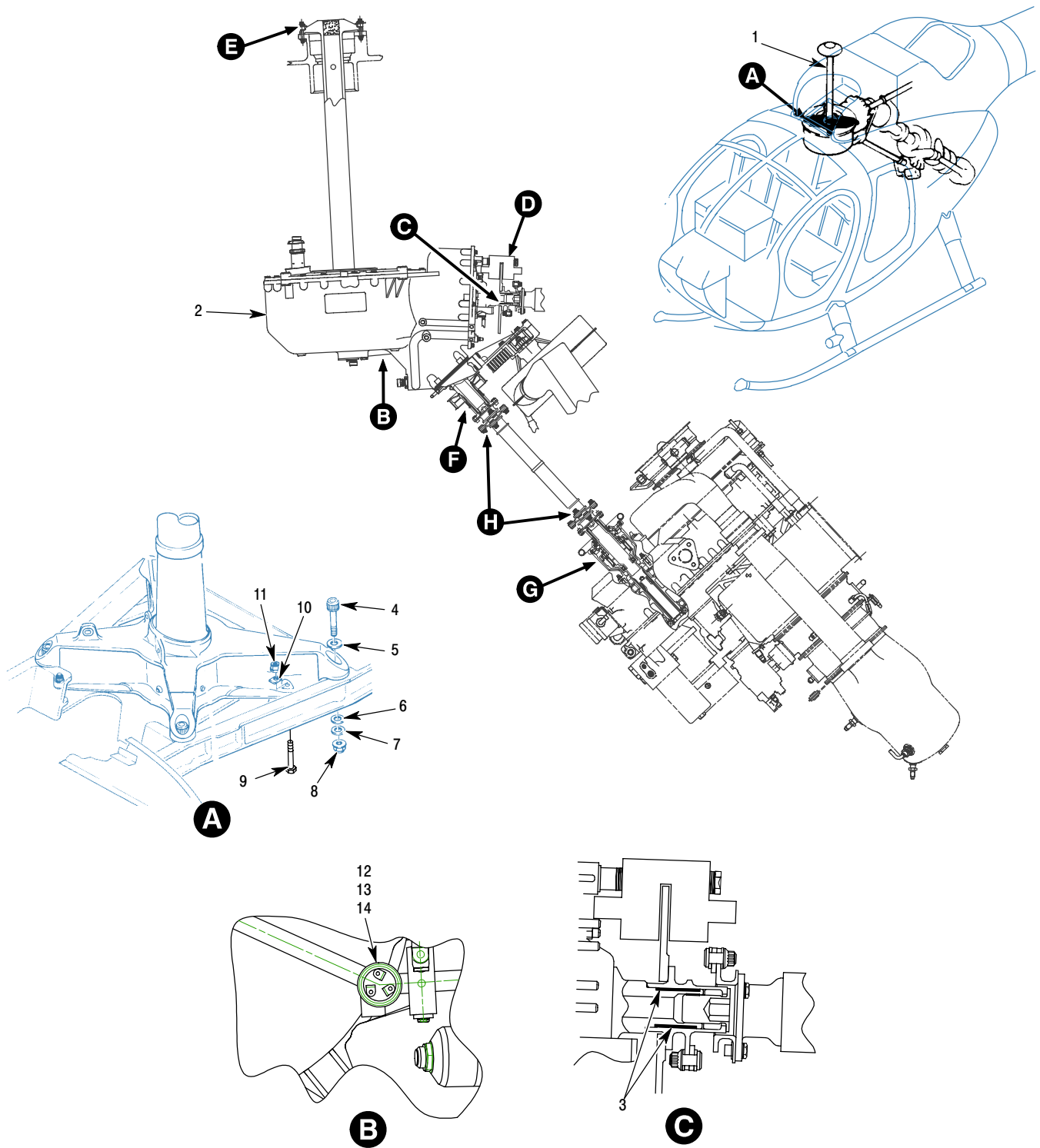


CSP102-016-3A

Figure 1-1. Modification Kit Installation
Airframe Structure Upgrade Transmission
(Sheet 3 of 3)

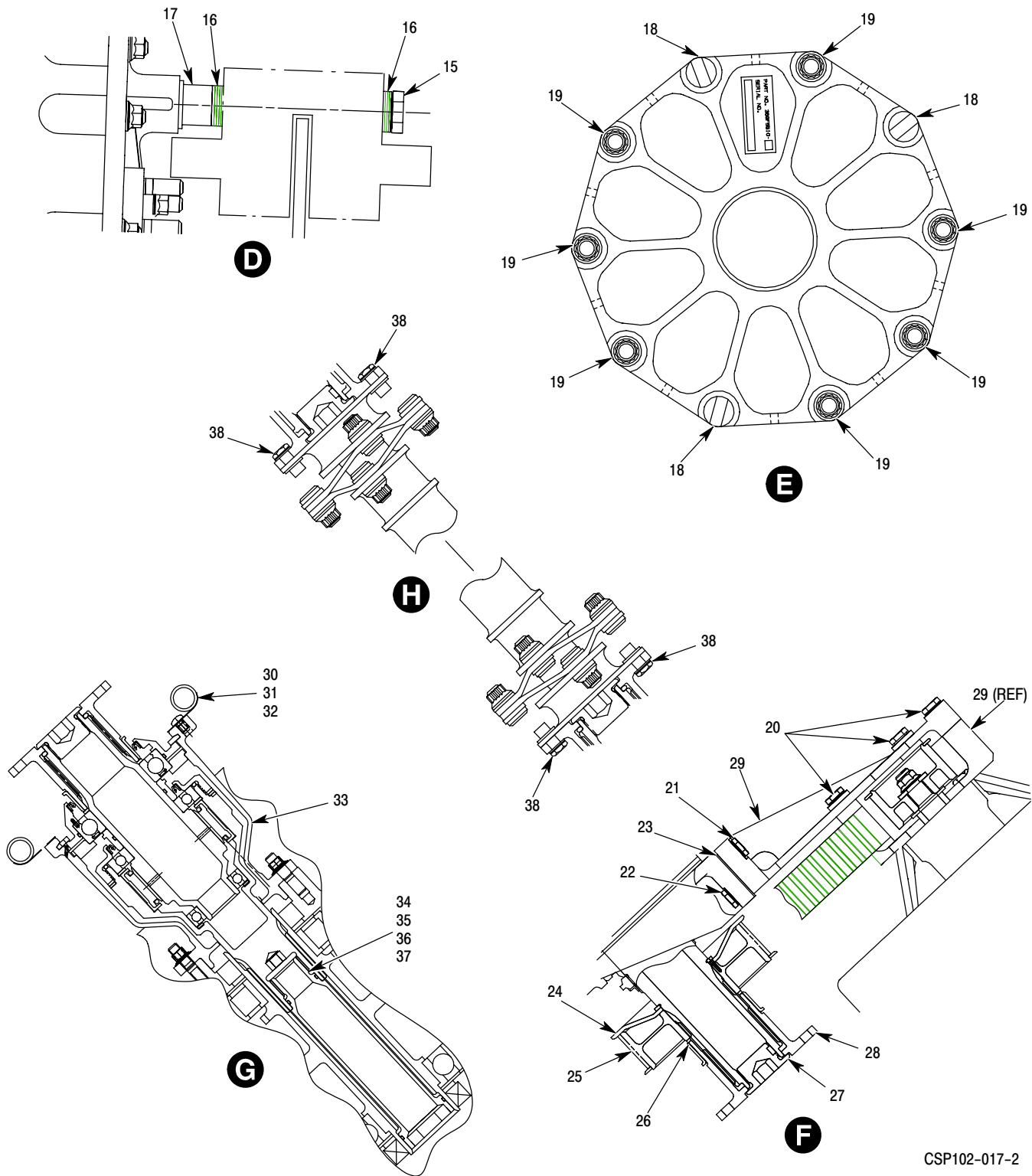
FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	QTY PER ASSY	SERIAL NUMBER EFFECTIVITY 369D/E/FF - 500N
1-1-	369D292300-501	Mod Kit Instl., Airframe Structure Upgraded XMSN With Heater (Commercial)	REF	ALL
	369D292300-505	Mod Kit Instl., Airframe Structure Upgraded XMSN Without Heater (Commercial & Military)	REF	ALL
	369D292300-701	Mod Kit Instl., Airframe Structure Upgraded XMSN With Heater (Military) ...	REF	ALL
-1	369D23011-49	. Channel	1	
-2	369D292301-1	. Angle	1	
-3	369D292301-2	. Angle	1	
-4	NAS1738B4-4	. Rivet (QPA 15 W/O heater)	17	
-5	369D292301-3	. Bracket Assy	1	
-6	MS20615-5M6	. Rivet	8	
-7	369H3011-27	. Shim	2	
-8	MS20615-4M5	. Rivet	12	
-9	MS20470AD4-5	. Rivet	8	
-10	HS5603-6-4	. Pin	4	
-11	HS5583-6	. Collar	4	
-12	MS20470AD5-5	. Rivet	19	
-13	MS20470AD5-7	. Rivet	8	
-14	MS20615-5M8	. Rivet	2	
-15	NAS1738B4-1	. Rivet	20	
-16	MS20470AD3-4	. Rivet	6	
-17	369D23011-39	. Fitting Assy.	1	
-18	NAS1738B4-3	. Rivet	4	
-19	369D22508-71	. Bracket (W/ heater only)	1	
-20	369D22508-69	. Panel	1	
-21	369D26553-11	. Clip	1	
-22	369D26553-12	. Clip	1	
-23	369D292481-1	. Splitter Duct Assy. (Commercial)	1	
	369D292481-3	. Splitter Duct Assy.(Military)	1	
-24	NAS1402-2	. Screw	1	
-25	AN960-8	. Washer	1	
-26	NAS1329A08-75	. Rivnut	1	
-27	MS21266-1N	. Grommet	AR	
-28	369D392475-17	. Duct Assy.	1	
29	369D292485-1	. Hose (W/ heater only)	1	
-30	HS4020A3600	. Seal	1	

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	QTY PER ASSY	SERIAL NUMBER EFFECTIVITY 369D/E/FF - 500N
-31	MS35489-14	.Gromment	1	
-32	H5-5100-134	. Baffle Assy	1	
-33	NAS603-8	. Screw	37	
-34	AN960KD10L	. Washer	AR	
-35	H5-5100-121	. Seal Assy. LH	1	
-36	H5-5100-122	. Seal Assy. RH	1	
-37	H5-5100-103	. Driveline Cover	1	
-38	MS20470D4-4	. Rivets	4	
-39	HS5604-5-2	. Pin	2	
-40	HS5614-5	. Collar	2	



CSP102-017-1

Figure 1-2. Upgraded Main Rotor Driveline Modification Kit
(Sheet 1 of 2)



CSP102-017-2

Figure 1-2. Upgraded Main Rotor Driveline Modification Kit
(Sheet 2 of 2)

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	QTY PER ASSY	SERIAL NUMBER EFFECTIVITY 369D/E/FF - 500N
1-2-	369F9500-505	Upgraded Driveline Mod. Kit For XMSN Only	REF	ALL
	369F9500-503	Upgraded Driveline Mod. Kit (C20 Engine)	REF	ALL
	369F9500-501	Upgraded Driveline Mod. Kit (C30 Engine)	REF	ALL
-1	369F5510-1	. Main Rotor Driveshaft	1	
-2	369F5100-503	. Transmission Assy	1	
-3	369A5516-3	. Shim	AR	
	369A5516-5	. Shim	AR	
	369A5516-7	. Shim	AR	
	369A5516-9	. Shim	AR	
-4	MS21250-08058	. Bolt	4	
-5	MS20002C8	. Washer	4	
-6	AN960-816L	. Washer	4	
-7	AN960-816	. Washer	4	
-8	42FW820	. Nut	4	
-9	NAS6605-1 1	. Bolt	4	
-10	369A2033	. Washer, Special	4	
-11	MS21044N5	. Nut	4	
-12	147D-2	. Snubber	1	
-13	NAS617-6	. Packing	1	
-14	76072-15	. Pressure Switch	1	
-15	NAS6606H52	. Bolt	2	
-16	AN960-616LL	. Washer	9	
-17	HS4620C19-29	. Bushing	2	
-18	369D21010-3	. Eyebolt (Use/W 369F5510-1)	3	
-19	HS5798-4-26	. Bolt	7	
-20	NAS6604H8	. Bolt	4	
-21	NAS6604H7	. Bolt	2	
-22	NAS6604H6	. Bolt	2	
-23	369F5193-1	. Shim	1	
-24	369F5138-1	. Pulley Guard	1	
-25	369F5137-1	. Pulley Driver	1	
-26	369F5155-1	. Input Coupling Shim	1	
-27	369F5160-1	. Input Bolt	1	
-28	369F5133-1	. Input Coupling	1	
-29	369F5190-1	. Oil Cooler Fan Bracket	1	
-30	MS51957-42	. Screw (Use/W 369F5450-501)	3	

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION	QTY PER ASSY	SERIAL NUMBER EFFECTIVITY 369D/E/FF - 500N
1-2-31	NAS620A8L	. Washer (Use/W 369F5450-501)	3	
-32	369F5467-1	. Seal Assy (Use/W 369F5510-1)	1	
-33	369F5450-501	. Clutch Assembly	1	
-34	369F5468-1	. Bolt (C20 Engine)	1	
-35	369F5469-1	. Bolt (C30 Engine)	1	
-36	M83248/1-019	. Packing (Use/W 369F5450-501)	1	
-37	M83248/1-206	. Packing (Use/W 369F5450-501)	1	
-38	NAS6604-5	. Bolt (QPA of 4 on 369F95000-505)	8	

SECTION 2

MAINTENANCE INSTRUCTIONS

2-1. **Scope**

This section provides information for the conversion of the 369D/E/FF - 500N Model helicopters to the larger 369F5100 transmission, 369F5450 overrunning clutch assembly and 369F5510 main rotor drive shaft. When modifying the helicopter to the larger 369F5100 transmission, it is recommended, but not required, to convert to the larger overrunning clutch and main rotor drive shaft at the same time.

The tasks in this section are arranged in a logical order in which they should be accomplished.

2-2. **Serial Number Applicability**

According to helicopter serial number (S/N), not all tasks may need to be performed. Tasks that do not have a S/N in the title pertain to all helicopters. Tasks that have a S/N in the title pertain to only those helicopters.

2-3. **Reference Data**

When performing the following procedures, refer to the appropriate maintenance manual. All references are to the Handbook of Maintenance Instructions (CSP-HMI-2) unless stated otherwise.

2-4. **Initial Preparation**

Prepare the aircraft for conversion as follows:

- a. Identify all components, including attaching hardware, and components removed for access to work areas. Protect components from damage and contamination until installed.
- b. Turn off all electrical power and disconnect battery.

2-5. **Equipment Removal**

Refer to CSP-HMI-2 for detailed removal procedures; remove the following items:

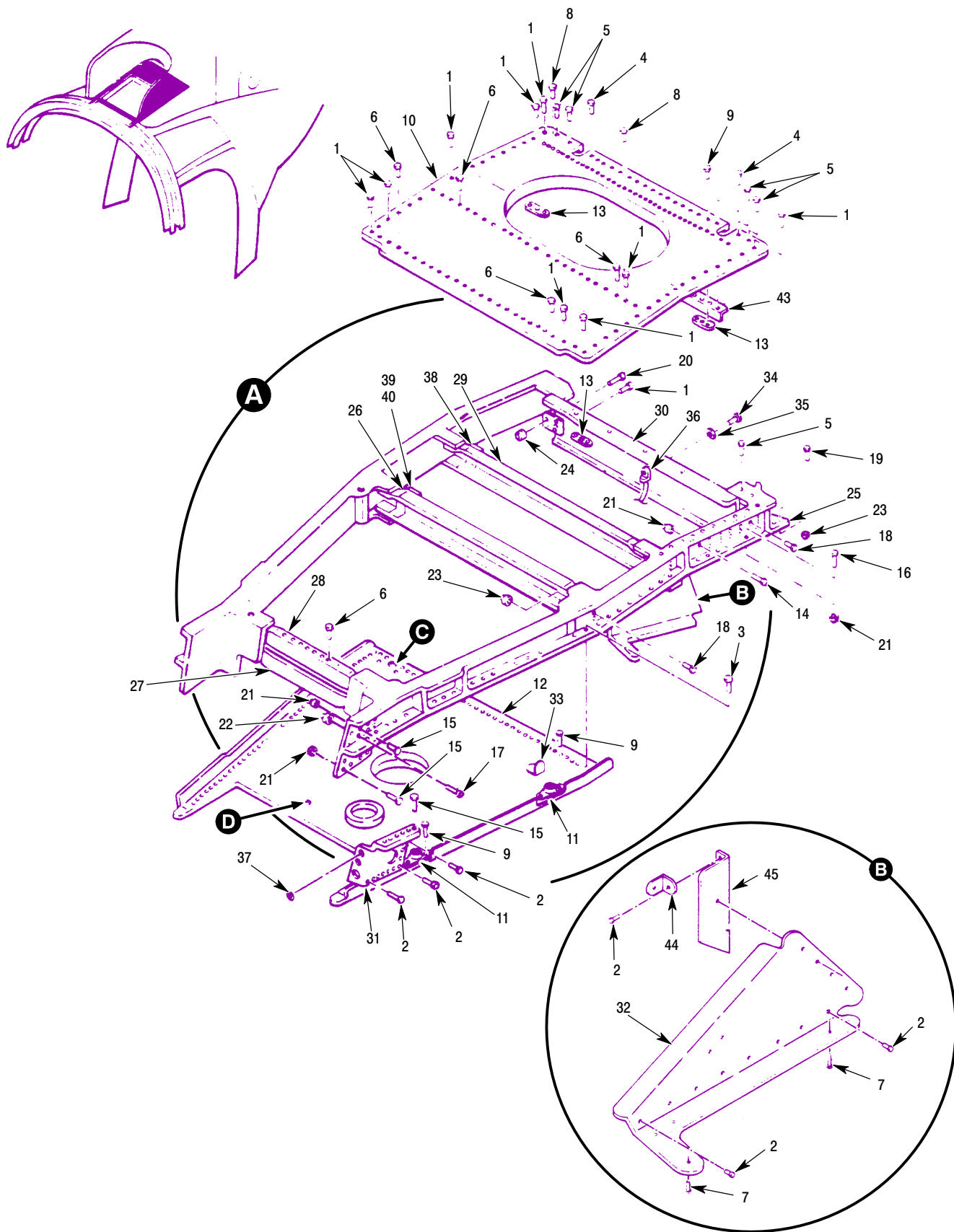


- The following parts are to be removed from the helicopter for access to work areas and to remove weight to prevent possible airframe warpage.
- Do not remove the mast base, this will assist in keeping the airframe rigid.

NOTE

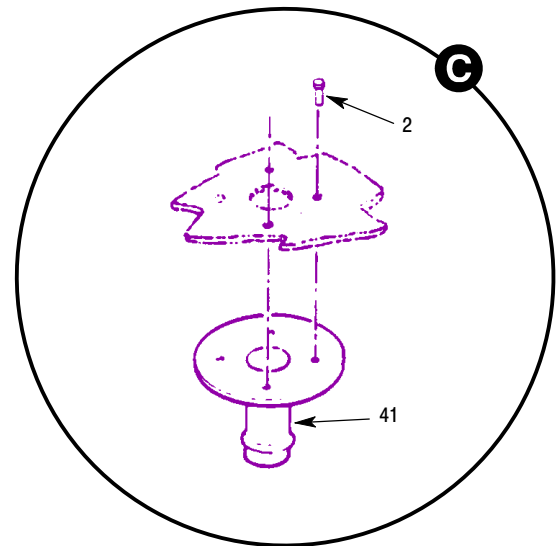
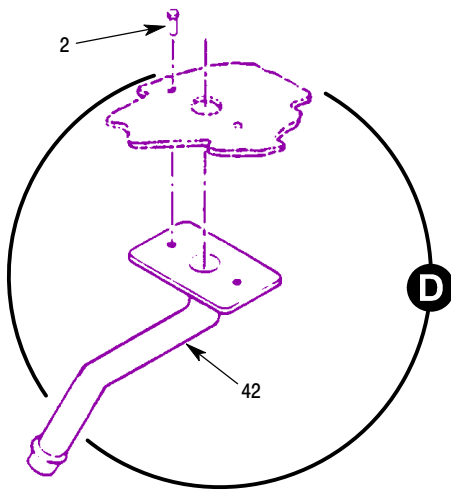
If helicopter is equipped with Bendix couplings or main transmission drive shaft, it must be converted to Kamatic couplings and drive shaft.

- a. Main rotor blades (Ref. Sec. 62-10-00).
- b. Main rotor drive shaft (Ref. Sec. 63-10-00).
- c. Main rotor hub (Ref. Sec. 62-20-00).
- d. Main rotor swashplate and mixer assembly (Ref. Sec. 62-30-00).
- e. Intake fairings (Ref. Sec. 53-30-00 or 53-30-30).
- f. Anti-torque drive shaft access screen under intake fairings (Ref. Sec. 52-50-00).
- g. Anti-torque flight controls from upper deck (Ref. Sec. 67-20-10 or 67-20-30).
- h. All interior trim and insulation from cargo compartment (Ref. Sec. 25-30-00).
- i. Tunnel-routed control tubes (Ref. Sec. 67-10-00).
- j. Sta. 124.00 bulkhead panels (Ref. Sec. 25-30-00).
- k. Main transmission drive shaft (Ref. Sec. 63-10-00).
- l. Oil cooler blower (Ref. Sec. 63-21-00).
- m. Overrunning clutch assembly (Ref. Sec. 63-10-00).
- n. Engine and attaching hardware (Ref. Sec. 71-00-00 or 71-00-30).
- o. Tail rotor assembly (369D/E/FF) (Ref. Sec. 64-20-00).
- p. Tail rotor gearbox and drive shaft (369D/E/FF) (Ref. Sec. 63-15-10).
- q. Tail rotor control rod assembly (369D/E/FF) (Ref. Sec. 67-20-10).
- r. Horizontal and vertical stabilizers (Ref. Sec. 53-50-10 or 53-50-30).
- s. Tailboom assembly (Ref. Sec. 53-40-00 or 53-40-30).
- t. Heater ducting from around transmission assembly compartment area (if installed) (Ref. Sec. 21-40-00).
- u. Rotor brake, if installed (Ref. Sec. 63-22-00).
- v. Main transmission (Ref. Sec. 63-20-00).
- w. Anti-ice cable assembly (if equipped with a 250-C20B engine) (Ref. Sec. 75-10-00).



56-031-1

Figure 2-1. Mast Support Structure (Sheet 1 of 2)



1	MS20615M5	Rivet
2	MS20470AD3	Rivet
3	MS20615M3	Rivet
4	MS20426AD4	Rivet
5	MS20427M5	Rivet
6	MS20470AD5	Rivet
7	MS20470AD4	Rivet
8	MS20426AD5	Rivet
9	MS20426AD3	Rivet
10	369D23011-13	Panel
11	NAS697A3	Nutplate
12	369D23011-31	Pan
13	MS21075L3	Nutplate
14	NAS1465-2	Pin
15	NAS1465-3	Pin
16	NAS1465-4	Pin
17	NAS1425-3	Pin
18	NAS1466-3	Pin
19	NAS1466-4	Pin
20	NAS1426-3	Pin
21	NAS1080-5	Collar
22	NAS1080C5	Collar
23	NAS1080-6	Collar
24	NAS1080C6	Collar
25	369H3003-1	Fitting, LH
	369H3003-2	Fitting, RH

26	369H3011-13	Channel
27	369H3011-37	Angle
28	369H3011-39	Angle
29	369H3011-15	Channel
30	369H3011-17	Channel
31	369H3011-19	Panel, LH
	369H3011-21	Panel, RH
32	369H3011-23	Panel, LH
	369H3011-24	Panel, RH
33	369H3011-33	Clip
34	MS20470A4	Rivet or
	MS20470AD4	Rivet
35	AN960PD6L	Washer or
	AN960PD4	Washer
36	TC814	Strap or
	SSC2M	Strap
37	NAS557-4	Grommet
38	369H3011-29	Shim
39	369H3011-27	Shim
40	369H3011-25	Shim
41	369H23011-1 1	Fitting Assy
42	369H23011-21	Fitting Assy
43	369H23011-33	Angle
44	369H23011-5	Angle
45	369H23011-3	Angle, LH
	369H23011-3	Angle, LH

Figure 2-1. Mast Support Structure (Sheet 2 of 2)

2-6. Canted Station 124.00 Modification

Expendable Materials Refer to Table 2-1	
Nomenclature	Item
Primer	3
Primer (epoxy)	10

2-7. Frame Rework

(Ref. Figure 2-2)

NOTE

There are different part number frames that may be installed in the aircraft (369D23008-5, -15 or 369D23009-13).

- Remove (4) MS20615M5 and (19) MS20470AD5 rivets from 369H3011-15 channel common to 369D23011-13 panel.
- Remove (26) MS20470AD4 rivets from 369H3011-15 channel common to 369D23008-5 frame.
- Remove (4) NAS1466-4 lockbolts from sides of 369H3011-15 channel.
- Remove (4) MS20615M5 rivets from bottom of 369H3011-15 channel common to 369H3003 mast support.
- For 500N Model helicopters only, carefully drill out rivets securing 500N3000-29 clip and remove.

NOTE

The 500N3000-29 clip will be re-used when installing the new channel.

- Carefully slide 369H3011-15 channel forward and out.

NOTE

Helicopters may have either a 369D23008-5, -15 or 369D23009-13 frame.

- Modify 369D23008-5, -15 (or 369D23009-13) frame as follows:



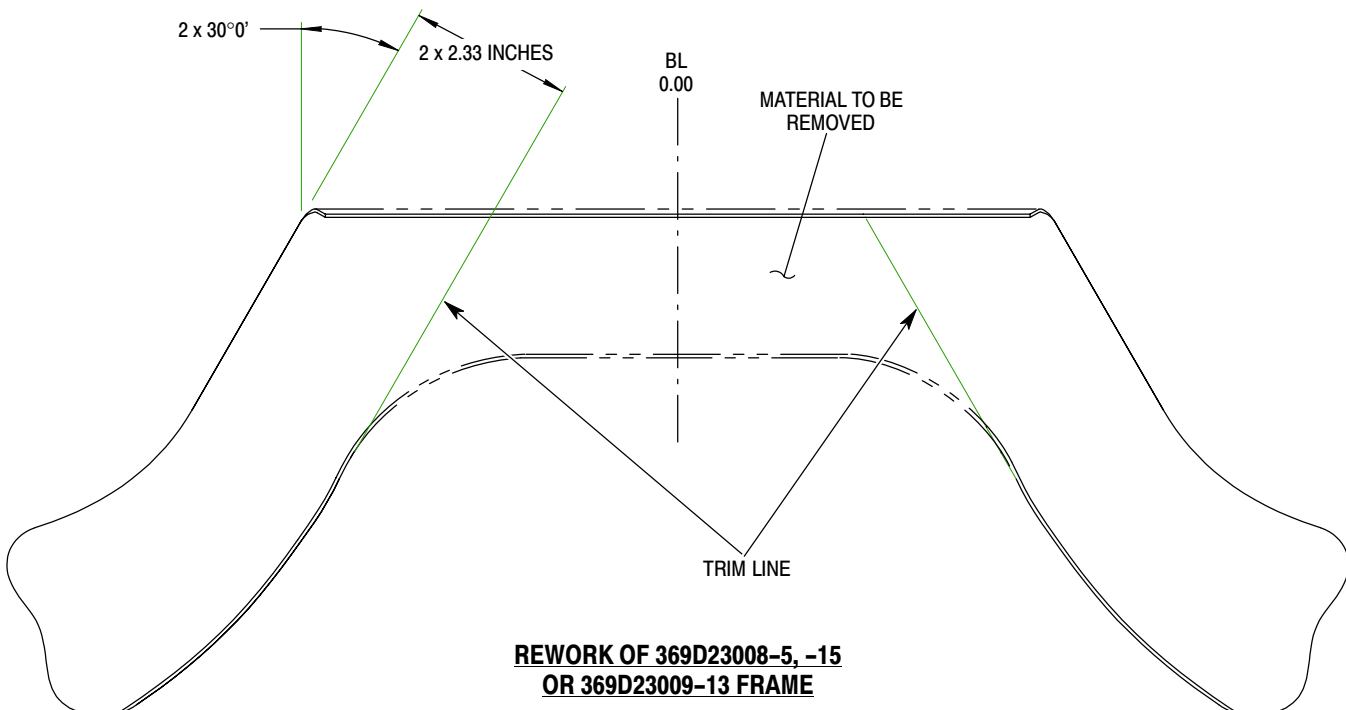
When marking the frame, ensure that cut-lines will have proper edge distance from existing rivet holes that are to remain.

- Measure 2.33 inches (59.2 mm) from outsides of frame and mark for cut.



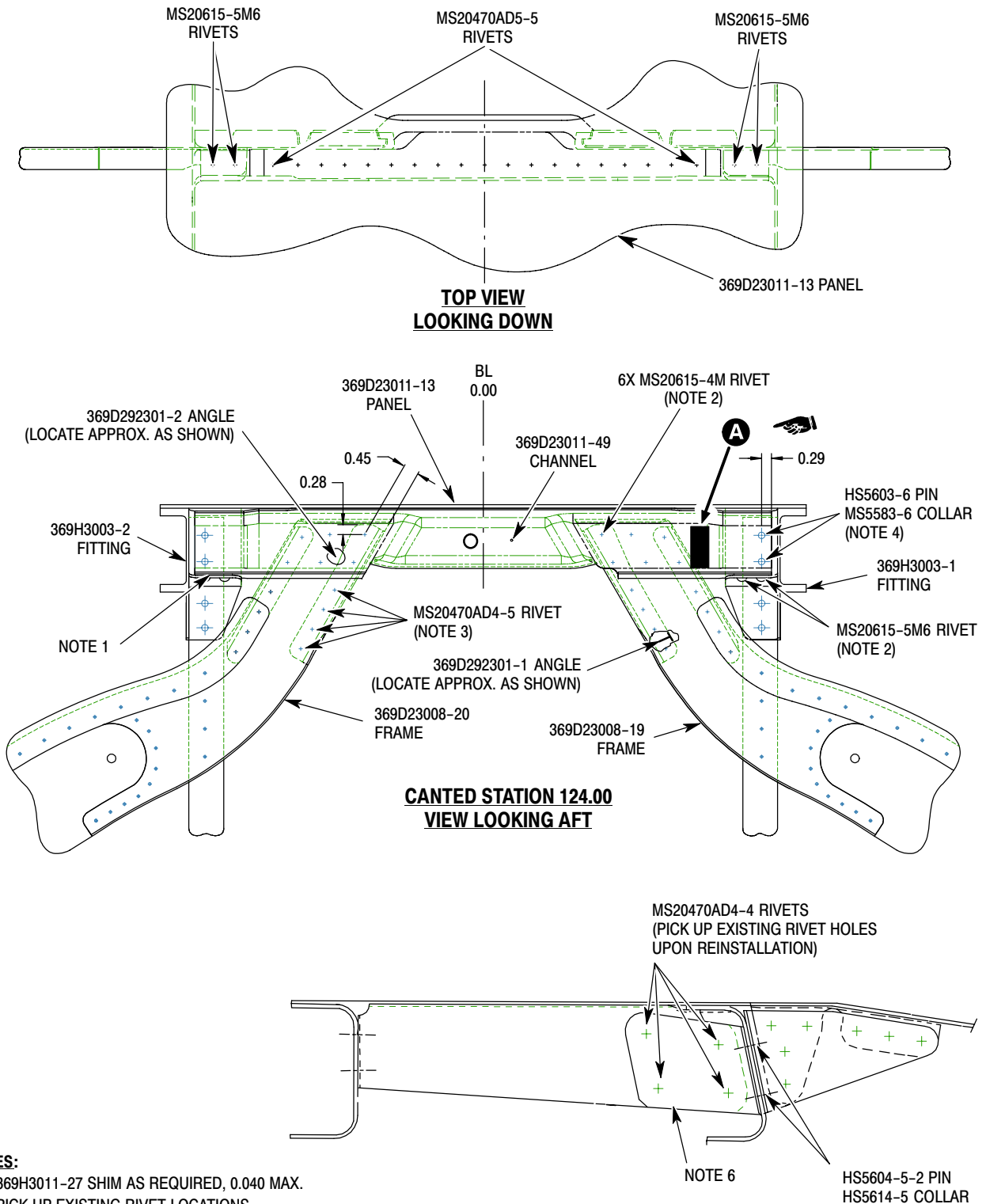
Always protect surrounding components from damage. Major damage can occur if precautions are not taken.

- Slide a thin piece of stainless sheet between frame and 369D23011-13 panel.



CSP102-003-1

Figure 2-2. Canted Station 124.00 Frame Modification (Sheet 1 of 2)



NOTES:

1. 369H3011-27 SHIM AS REQUIRED, 0.040 MAX.
2. PICK UP EXISTING RIVET LOCATIONS.
3. PICK UP EXISTING PILOT HOLES.
4. 0.189-0.191 HOLE IN 369D23011-49 CHANNEL TO MATCH MAST SUPPORT.
5. ALL DIMENSIONS IN INCHES.
6. ON 500N MODELS ONLY, REMOVE THIS BRACKET FOR EASE OF REMOVING CHANNEL; REINSTALL BRACKET AFTER NEW CHANNEL IS INSTALLED.



CSP102-003-2A

Figure 2-2. Canted Station 124.00 Frame Modification (Sheet 2 of 2)

- 3). Using extreme care, cut frame along mark with a cutting disc.
- 4). Deburr cuts and touch up with primer (3, Table 2-1).

2-8. 369D23011-49 Channel Installation

(Ref. Figure 2-2)

NOTE

- When locating the 369D23011-49 channel, ensure channel edge distance is equal on both sides and channel is positioned firmly against 369D23011-5 frame and 369D23011-13 panel.
- Install all rivets wet using epoxy primer (10).
 - a. Locate and secure 369D23011-49 channel in place on forward side of 369D23008-19 and -20 frames.
 - b. Reinstall 500N3000-29 clip as follows:
 - 1). Using existing rivet holes on common to clip and 500N3000-35 channel.
 - 2). Using -29 clip holes as a guide, drill two 0.3085 - 0.3105 holes through clip and -49 channel.
 - 3). Install two HS5604-5-2 pins with HS5614-5 collars.
 - c. Back drill and cleco (12) #30 holes from frame through channel.
 - d. Locate and secure 369D292301-1 and -2 angles in place on aft side of 369D23008-19 and -20 frames.
 - e. Using pilot holes in -1 and -2 angles, drill and cleco (8) #30 holes through channel.

- f. Back drill and cleco (23) #20 holes from panel through top flange of channel.

NOTE

A maximum of 0.040-in. (1.0 mm) shims are allowed between channel and 369H3003-1 and -2 fittings.

- g. Install shims, as required, between bottom of channel and 369H3003-1 and -2 fittings.
- h. Back drill (4) #20 holes from the -1 and -2 fittings through bottom flange (outboard ends) of channel.
- i. Back drill and cleco (4) 0.189-0.191 inch holes from mast support in outboard ends of channel.
- j. Deburr holes and touch up with primer (4).
- k. Install (4) MS20615-5M6 rivets from panel through top flange (outboard ends) of channel.
- l. Install (19) MS20470AD5-5 rivets from panel through top flange of channel.
- m. Install (4) MS20615-5M6 rivets from 369H3003-1 and -2 fittings through shims into bottom flange (outboard ends) of channel.
- n. Install (4) HS5603-6 pins and HS5583-6 collars through outboard ends of channel and mast support.
- o. Install (8) MS20470AD4-5 rivets through 369D292301-1 and -2 angles and frame.
- p. Install (12) MS20615M4-5 rivets through angles, frame and channel.
- q. Touch up rework area with primer (4).

(Ref. Figure 2-3) The aft mast base drain must be moved outboard and aft for clearance when installing the larger transmission.

Expendable Materials Refer to Table 2-1	
Nomenclature	Item
Sealing compound	2
Primer (epoxy)	10
Acrylic lacquer	14

- 2-9. Aft Mast Base Drain Relocation**
(Ref. Figure 2-3) The aft mast base drain must be moved outboard and aft for clearance when installing the larger transmission.

Expendable Materials Refer to Table 2-1	
Nomenclature	Item
Sealing compound	2
Primer (epoxy)	10
Acrylic lacquer	14

 - Remove (4) MS20470AD3 rivets securing drain to mast base pan.
 - Remove sealant from around drain and remove drain.
 - Thoroughly clean remaining sealant from pan and drain.
 - From center of drain hole, mark pan 0.90-in. (22.9 mm) outboard and 0.20-in. (5.1 mm) aft for new drain hole.
 - Trim aft side drain flange as shown with a 0.13 radius at each end of cut.
 - Using forward rivet holes in drain flange, drill and cleco (2) #40 holes in pan.
 - Using existing aft-outboard rivet hole in pan, drill and cleco (1) #40 hole in drain flange.
 - Locate and drill remaining #40 hole through drain flange and pan, 0.50-in. (12.7 mm) outboard and 0.18-in. (4.6 mm) aft of drain hole.
 - Drill 0.250-in. hole in pan to match drain.
 - Remove drain.
 - Deburr pan and drain, and touch up with paint (14, Table 2-1) as required.

NOTE

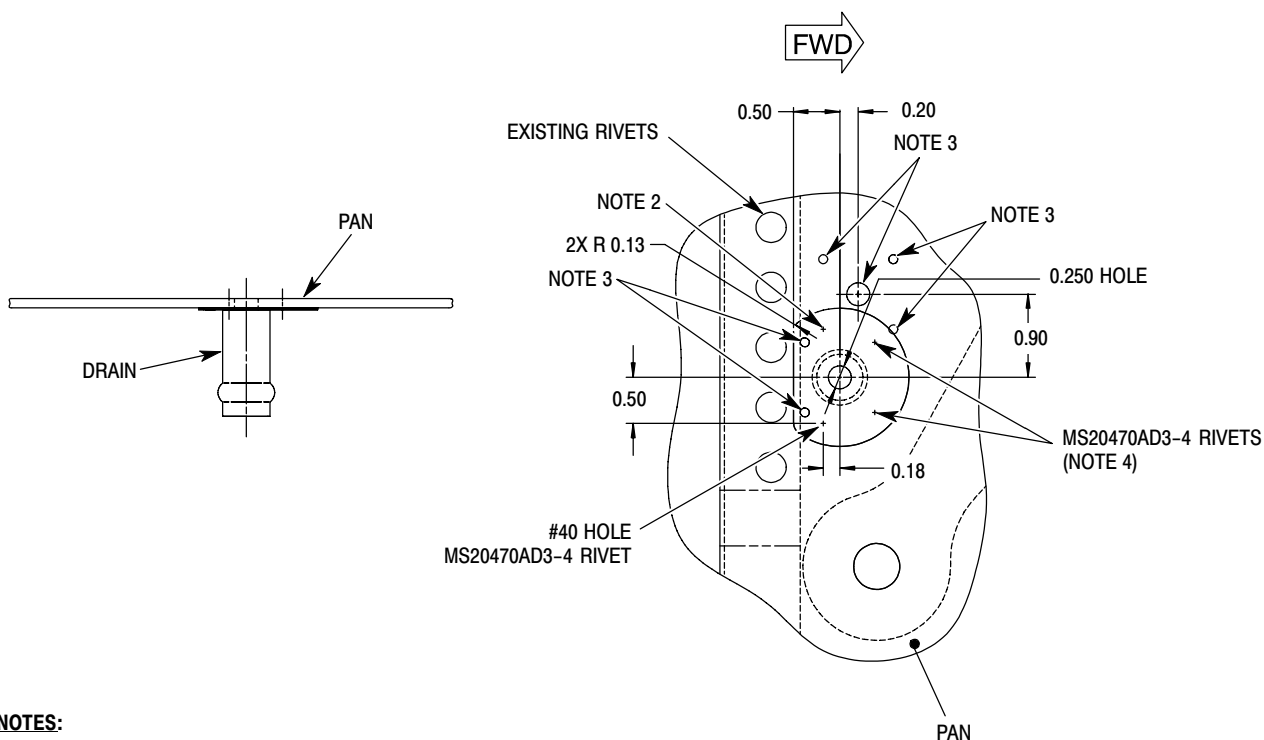
Install all rivets wet using epoxy primer (10).

 - Apply a thin coat of sealant (3) to drain flange and install drain using (4) MS20470AD3-4 rivets.
 - Clean excess sealant from center hole of drain and outside of flange.
 - Seal all existing rivet holes with sealant (2).

NOTE

Install all rivets wet using epoxy primer (10).

- l. Apply a thin coat of sealant (3) to drain flange and install drain using (4) MS20470AD3-4 rivets.
- m. Clean excess sealant from center hole of drain and outside of flange.
- n. Seal all existing rivet holes with sealant (2).



NOTES:

1. ALL DIMENSIONS IN INCHES.
2. MS20470AD3-4 RIVET. PICK UP EXISTING RIVET LOCATION.
3. FILL EXISTING HOLES WITH SEALANT (3, TABLE 201, 91-00-00).
4. PICK UP EXISTING RIVET LOCATIONS IN DRAIN FITTING.

Figure 2-3. Aft Mast Base Pan Drain Modification and Relocation

2-10.Canted Station 78.50 Modification

(Ref. Figure 2-4)

Expendable Materials Refer to Table 2-1	
Nomenclature	Item
Sealing compound	2
Primer (epoxy)	10
Acrylic lacquer	14

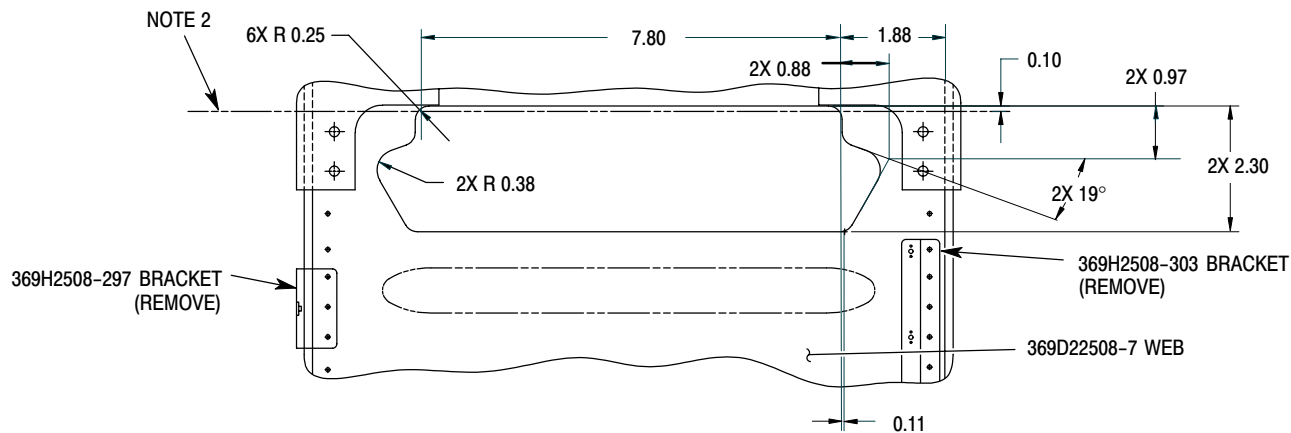
2-11.Forward Mast Base Drain Removal

- a. Remove (2) MS20470AD3 rivets from drain common to mast base pan.

- b. Slide fitting through hole in 369D22508-7 web and remove.
c. Fill existing holes with sealant (2, Table 2-1).

2-12.369D22508-7 Web Modification

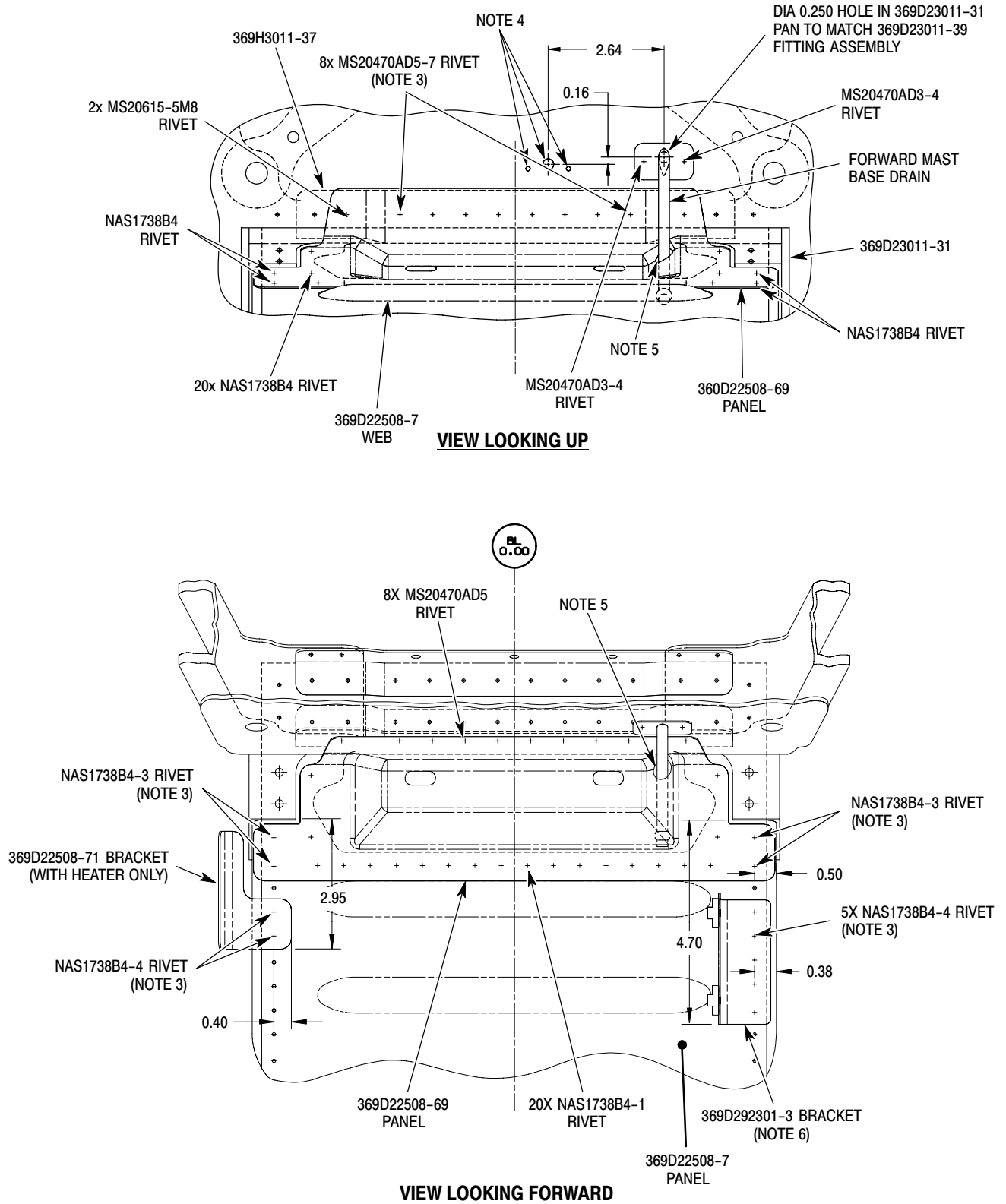
- a. Remove (6) MS20470AD4 rivets from 369H2508-303 bracket; remove bracket.
b. Remove hardware connecting heater duct to 369H2508-297 bracket (if equipped with heater system).
c. Remove (3) MS20470AD4 rivets from 369H2508-297 bracket; remove bracket.
d. Mark web for cutout ensuring correct corner radius.
e. Cut out and deburr web.
f. Touch up edges with paint (14).

**VIEW LOOKING FORWARD****NOTES:**

1. ALL DIMENSIONS IN INCHES.
2. INTERSECTION LINE BETWEEN 369D23011-31 PAN AND 369D22508-7 WEB.
3. PICK UP EXISTING RIVET LOCATIONS.
4. FILL EXISTING HOLES WITH SEALANT (3, TABLE 201, 91-00-00).
5. FILL GAP AROUND TUBE WITH SEALANTS (3).
6. LOCATE VERTICALLY WITH EQUAL DISTANCE ON BOTH SIDES AND/OR TO ELIMINATE INTERFERENCE WITH EXISTING RIVET HEADS.

CSP102-004-1

Figure 2-4. Canted Station 78.50 Frame Modification (Sheet 1 of 2)



CSP102-004-2

Figure 2-4. Canted Station 78.50 Frame Modification (Sheet 2 of 2)

2-13.369D22508-69 Panel Installation

- a. Insert 369D22508-69 panel into 369D22508-7 web from the aft side.
- b. Position panel vertically against the mast base pan and equally side-to-side.
- c. Back drill and cleco (4) #30 holes through edges of panel.
- d. Drill and cleco (20) #30 holes along bottom and sides of panel.
- e. Back drill and cleco (10) #20 holes along top of panel.

NOTE

Install all rivets wet using epoxy primer (10)

- f. Install (4) NAS1738B4-3 rivets in holes on outboard edges of panel.
- g. Install (20) NAS1738B4-1 rivets in holes common to panel and web.
- h. Install (2) MS20615-5M8 rivets in holes at top on outboard edges of panel.
- i. Install (8) MS20470AD5-7 rivets in holes at top of panel common to pan.

2-14.Forward Mast Base Drain Installation

- a. Locate drain on mast base pan so tube protrudes through hole in 369D22508-69 panel.
- b. Mark and drill 0.250-in. hole in pan to match drain.
- c. Using drain as a pattern, drill and cleco (2) #40 rivet holes.
- d. Remove drain.
- e. Deburr and touch up drain and pan with paint (14).

NOTE

Install all rivets wet using epoxy primer (10)

- f. Apply a thin layer of sealant (2) to drain flange and install using (2) MS20470AD3-4 rivets.
- g. Clean excess sealant from center hole of drain and outside of flange.
- h. Fill gap around drain tube, where tube protrudes through panel with sealant (2).

2-15.369D22508-71 Bracket Installation

- a. Position bracket on -7 web vertically with equal distance on both sides and/or to eliminate interference with existing rivets.
- b. Back drill and cleco (2) #30 holes.

NOTE

Install all rivets wet using epoxy primer (10).

- c. Install (2) NAS1738B4-4 rivets.
- d. Reinstall hardware connecting heater duct to 369D22508-71 bracket (if equipped with heater system).

2-16.369D292301-3 Bracket Installation

- a. Position bracket on -7 web vertically with equal distance on both sides and/or to eliminate interference with existing rivets.
- b. Back drill and cleco (5) #30 holes.

NOTE

Install all rivets wet using epoxy primer (10).

- c. Install (5) NAS1738B4-4 rivets.

2-17.Convenience Panel and Heater Duct Modification

(Ref. Figure 2-5 and Figure 2-6) The following procedure is only for helicopters equipped with a heater system.

Expendable Materials Refer to Table 2-1	
Nomenclature	Item
Tape, pressure sensitive	5
Adhesive	7
Adhesive (epoxy)	8
Primer (epoxy)	10
Lockwire	11
Acrylic lacquer	14

2-18.Heater Component Removal

- a. Remove hardware securing 369D292475-13 (or -15) duct assembly to 369D22508-71 bracket.
- b. Remove clamps attaching duct to 369D292490 and 369D292503 hoses and remove duct.
- c. Remove clamp connecting 369D292503 hose to heating valve on convenience panel and remove hose.
- d. Remove convenience panel.
- e. Slide splitter duct up and free from vertical duct assemblies and remove.
- f. Remove all components from convenience panel.

2-19. Convenience Panel Modification

NOTE

Ensure proper corner radius when trimming convenience panel and 369D26553-5 bracket.

- Mark and trim panel, bracket and isolator mount as shown.
- Cut grommet to size.
- Using Adhesive (7, Table 2-1) bond grommet to panel.
- Touch up edges with paint (14).

2-20. 369D26553-11 and -12 Clip Installation

- Remove existing 369D26553-11 and -12 clips from panel and scrap.
- Locate 369D26553-11 and -12 clips, supplied with kit, and position vertically to achieve equal edge distance on both ends and/or to eliminate interference with existing rivets.
- Drill (5) #30 holes in each clip and cleco in place.

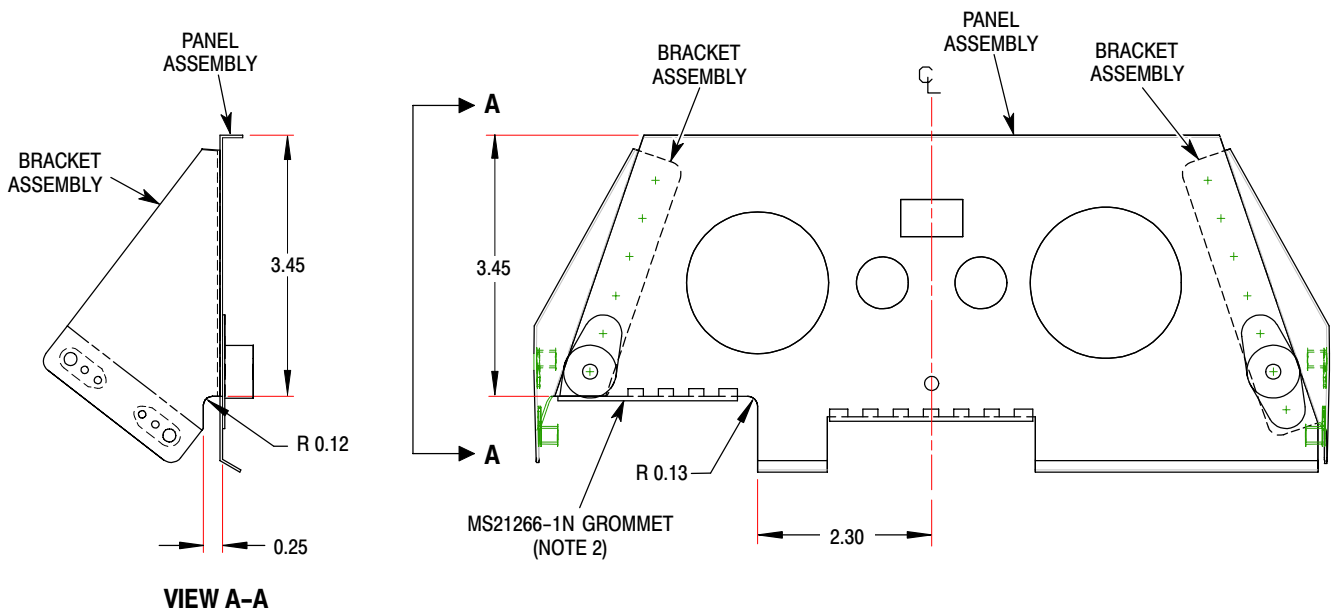
NOTE

Install all rivets wet using epoxy primer (10).

- Deburr and install NAS1738B4-4 rivets.

2-21. Heater Component Reinstallation

- Position new splitter duct in place; trim length, as required, for proper fit into 369D292478 ducts.
 - Reinstall components previously removed from convenience panel.
 - Using new mounting holes, reinstall convenience panel using existing hardware.
 - Install 369D292480-17 elbow on splitter duct; bond elbow to splitter duct with adhesive (8).
 - Connect 369D292503 hose to heater valve using existing hardware.
 - Install 369D292485-1 hose using existing hardware; attach to elbow using lockwire 0.032 (11).
 - Install 369D292475-17 duct between -1 hose and 369H92475-71 duct assembly.
- Using existing hardware to mount -17 duct to 369D22508-71 bracket, tighten nut until duct is snug against mounting bracket.
 - After the 369D292485-17 and 369H92475-71 ducts are assembled, seal the joint by wrapping with black 471 plastic friction tape (5).

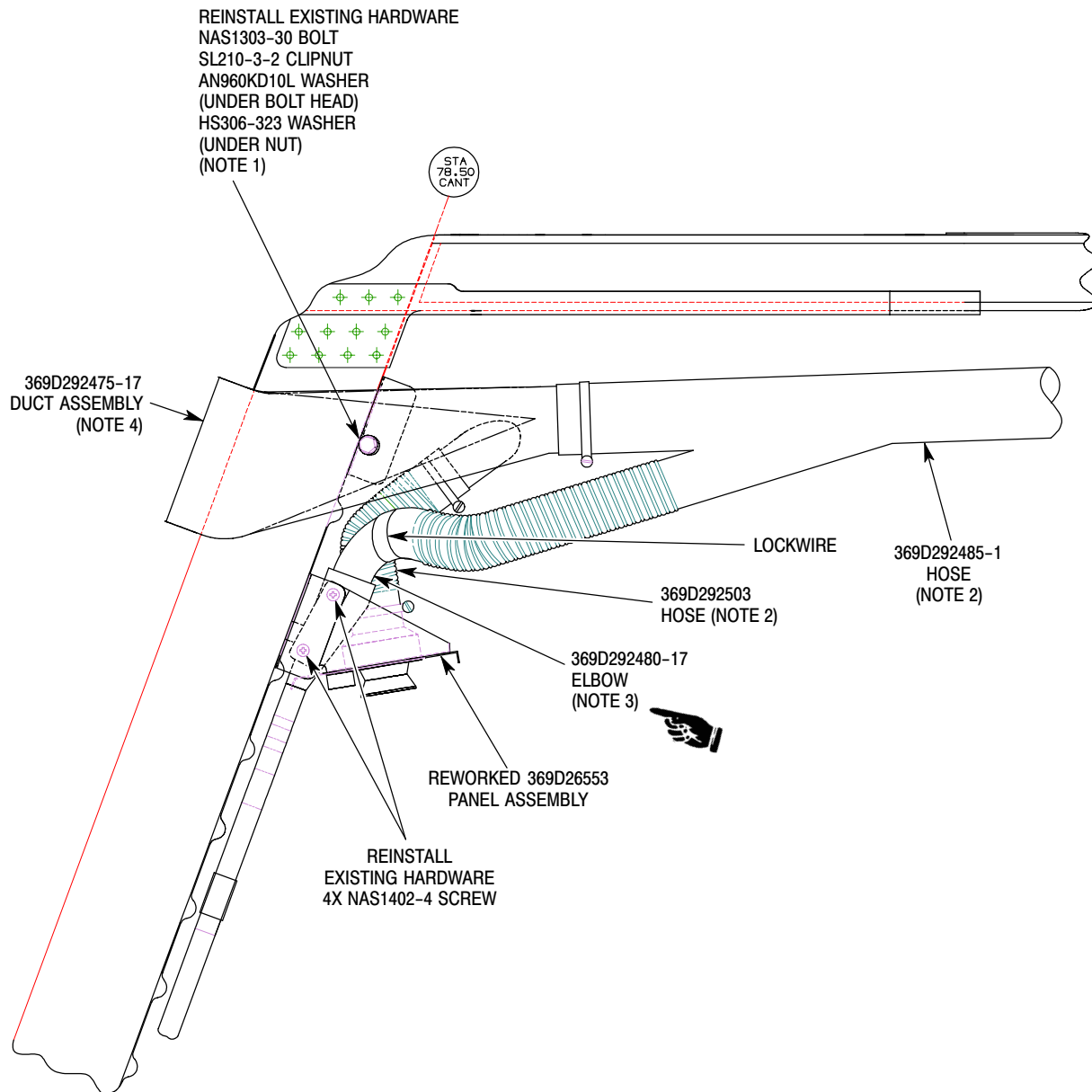


NOTES:

- ALL DIMENSIONS IN INCHES.
- CUT TO REQUIRED LENGTH.

CSP102-006

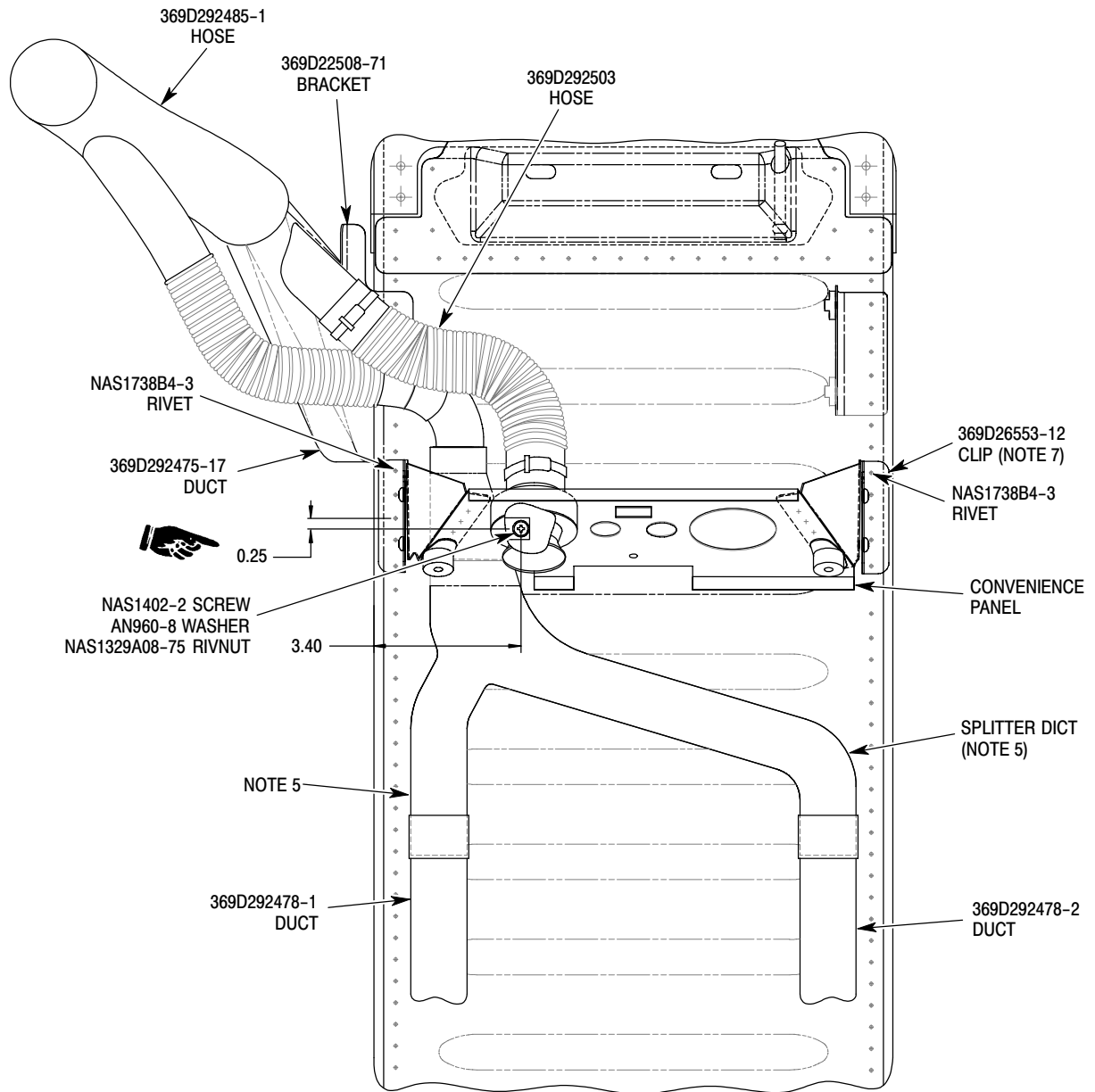
Figure 2-5. Convenience Panel Modification

**NOTES:**

1. TORQUE NUT UNTIL DUCT SUPPORT IS SNUGLY CLAMPED BETWEEN BOLT HEAD AND BRACKET.
2. REINSTALL HOSE USING EXISTING CLAMPS.
3. AFTER INSTALLATION, BOND ELBOW TO DUCT USING ADHESIVE (117, TABLE 201, 91-00-00).
4. AFTER 369H92475 AND 369D292475 DUCTS ARE ASSEMBLED, SEAL JOINTS BY WRAPPING WITH BLACK 471 PLASTIC FRICTION TAPE (32).
5. TRIM SPLITTER DUCT LENGTH, AS REQUIRED, FOR PROPER FIT.
6. ALL DIMENSIONS IN INCHES.
7. PICK UP EXISTING RIVET LOCATIONS.

CSP102-007-1A

Figure 2-6. Heater Duct Installation (Sheet 1 of 2)



CSP102-007-2A

Figure 2-6. Heater Duct Installation (Sheet 2 of 2)

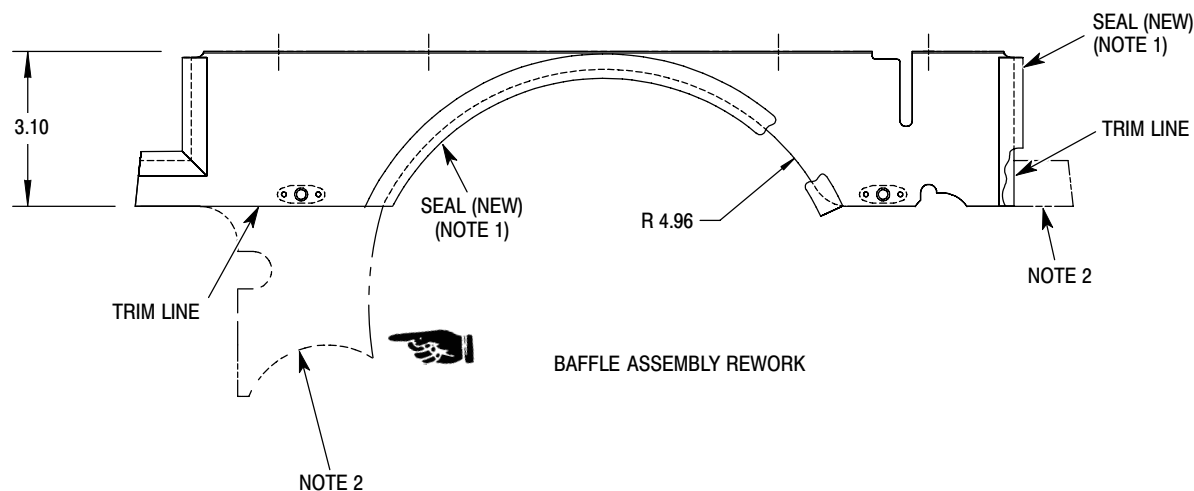
2-22. Baffle Assembly Modification

(Ref. Figure 2-7) The upper baffle must be modified for clearance when installing the 369F5100 transmission.

Expendable Materials Refer to Table 2-1	
Nomenclature	Item
Epoxy cement	13
Acrylic lacquer	14

- a. Remove 369D26541 baffle from helicopter.
- b. Remove seals from areas of baffle assembly to be modified.
- c. Trim baffle to dimensional requirements as follows:

- 1). Measure and mark 0.20-in. (5.1 mm) around inside of baffle as indicated: trim baffle.
- 2). Mark and trim corner seal and tab from side of panel.
- 3). Measure 3.10 inches (78.7 mm) from top of baffle and mark; trim baffle.
- 4). Deburr all trimmed areas.
- 5). Touch up trimmed edges with paint (14, Table 2-1).
- d. Cut new seal (HS4020A3600 or equivalent) to required length.
- e. Bond seals to baffle with cement (13).
- f. Re-identify baffle as 369D26541-33.
- g. Reinstall baffle in helicopter.

**NOTES:**

1. HS4020A3600 EXTRUSION, OR EQUIVALENT.
CUT TO REQUIRED LENGTH ON INSTALLATION.
2. MATERIAL TO BE REMOVED.

CSP102-008A

Figure 2-7. 369D26541 Baffle Assembly Modification

2-23. Main Transmission Build-Up

(Ref. Figure 2-8) Perform the following steps, as applicable, to build up the main transmission prior to installation.

Expendable Materials Refer to Table 2-1	
Nomenclature	Item
Solvent, dry cleaning	1
Sealant	2
Grease	4
Anti-seize compound	6
Cement	9
Lockwire	11

- a. If rotor brake is to be installed, proceed as follows:
 - 1). Position brake disc on drive coupling with raised center side of disc seated firmly on shoulder of coupling with bolt holes aligned.
 - 2). Insert four bolts through disc and coupling flange; install washers and nuts on bolts. Torque nuts, in alternating sequence, to **100 - 140 inch-pounds plus drag torque**.
- b. Install one preliminary 0.010 inch shim on output shaft to prevent coupling bolt from bottoming in shaft.

- c. Coat coupling splines with grease (4, Table 2-1) and coat bolt threads with anti-seize compounds (6) before assembly.
- d. Install shaft coupling and temporarily tighten coupling bolt to approximately **250 inch-pounds**.

NOTE

If rotor brake is installed, ensure electrical receptacle on the tachometer generator is clocked to the 11 o'clock position.

- e. Install tachometer generator with new gasket (Ref. Sec. 95-30-00, Tachometer Generator Replacement).
- f. Install input shaft seal drain connector, bonding it in place with sealant (2).

NOTE

On the 369F5100 transmission, the oil pressure switch is mounted on the bottom, right side, facing down.

- g. Install 369F5195-1 adapter, with teflon tape on threads, with new O-ring, and torque to **155 - 165 inch-pounds**.
- h. Using a new O-ring, install oil pressure switch and safety with lockwire (11).
- i. Clean main rotor output O-ring surface with a clean absorbent cloth dampened with solvent (1).
- j. Bond main rotor output shaft O-ring in place with cement (9).

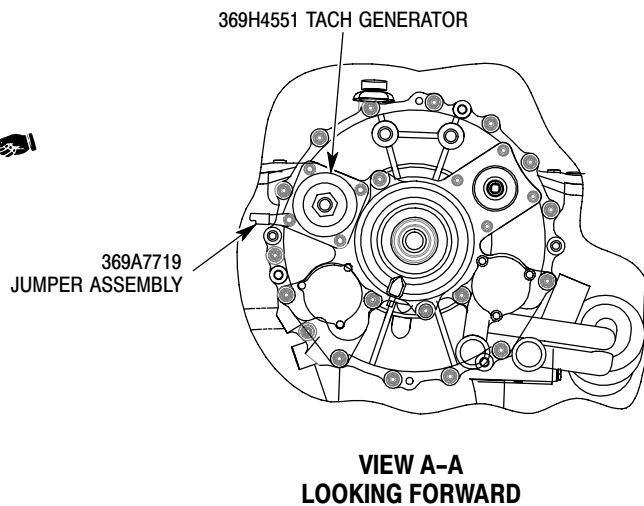
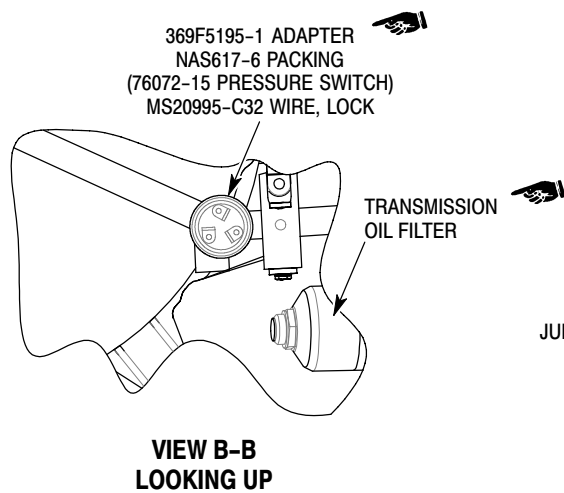
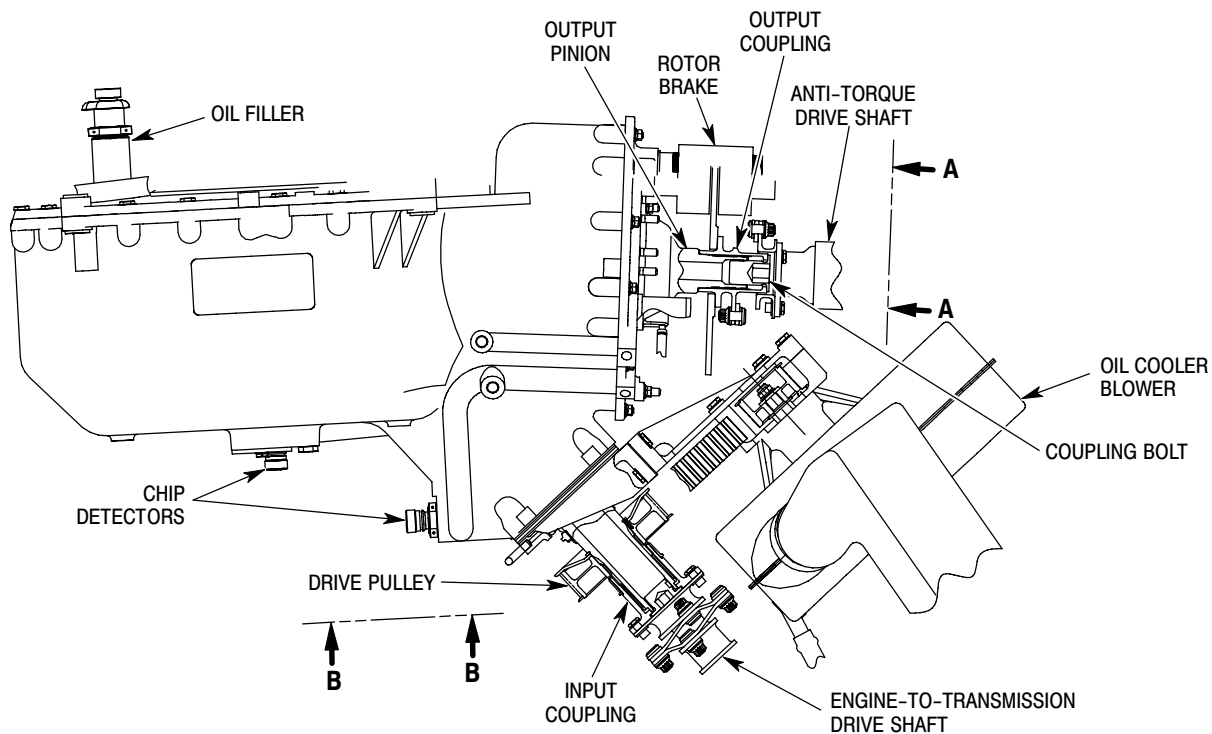


Figure 2-8. Main Transmission Build-Up

CSP102-009

2-24. Rotor Brake Caliper Installation

(Ref. Figure 2-9) The following procedure is for installation of the rotor brake caliper assembly. The caliper assembly should be installed on the transmission before the transmission is installed in the helicopter.

Expendable Materials Refer to Table 2-1	
Nomenclature	Item
Lockwire	11
Thread sealant	12

NOTE

- AN960-616LL washers are to be used for adjusting caliper-to-disc clearance.
- Nine washers are used on each attaching bolt; those not used as shims should be placed under bolt heads. Washer distribution should be the same for both bolts.
- a. Insert two NAS6606H52 bolts with equal number of washers through the caliper (washers can be on either side of caliper as needed) and install two HS4620C19-29 bushings.

NOTE

On the 369F5100 transmission, the brake caliper bolts directly to the transmission. The bracket used to mount the caliper on the old transmission will not be used.

- b. Mount the caliper assembly over disc and thread bolts into transmission.



To ensure optimum brake operation and minimize equipment damage, caliper-to-disc clearances on both sides of disc should be equal, or as nearly equal as possible. Clearance adjustment is accomplished by varying number of shim washers (0.032 inch thick) placed between the caliper assembly and transmission.

- c. Measure brake caliper housing-to-disc clearances on both sides of disc with a feeler gage. If clearances are equal within 0.032 inch, torque attaching bolts to **160 - 190 inch-pounds** and secure with lockwire (11, Table 2-1).

NOTE

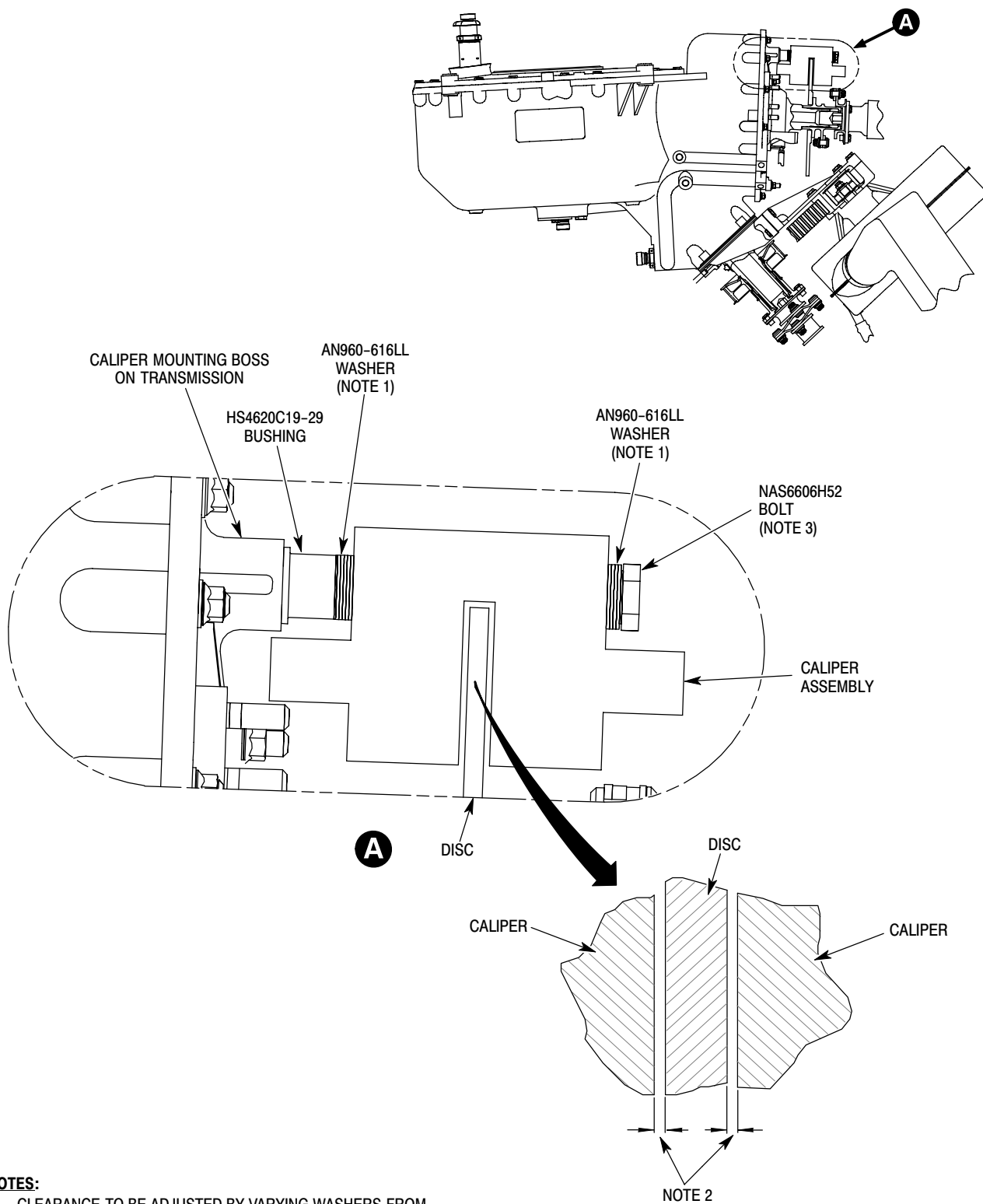
Clearance differences greater than 0.032 inch can be reduced by re-arranging washers on caliper attach bolts.

- d. To adjust clearances, hold caliper assembly and unscrew bolts from mounting bracket. Transpose washers on bolts as required. Reassemble parts and recheck clearances.

NOTE

If new caliper assembly was installed or if hydraulic fittings were removed from old unit, coat all but first two threads of two bleed screws, tees and plugs with thread sealant (12) or equivalent.

- e. Install plugs and tees in caliper assembly, screw adapters on tees and install bleed screws in adapters.
- f. Connect tube assemblies and tee units to tees.

**NOTES:**

1. CLEARANCE TO BE ADJUSTED BY VARYING WASHERS FROM EITHER SIDE OF CALIPER ASSEMBLY.
2. CLEARANCE TO BE EQUAL WITHIN 0.032 INCH.
3. TORQUE TO 160-190 INCH POUNDS AND SAFETY WITH LOCKWIRE (150, TABLE 201, 91-00-00).

CSP102-010

Figure 2-9. Rotor Brake Caliper Installation

2-25. Main Transmission Installation

(Ref. Figure 2-10)

- a. The main transmission mounting studs must be replaced with bolts. Replace studs as follows:



The main transmission mounting studs are left-handed, do not attempt to turn in the wrong direction.

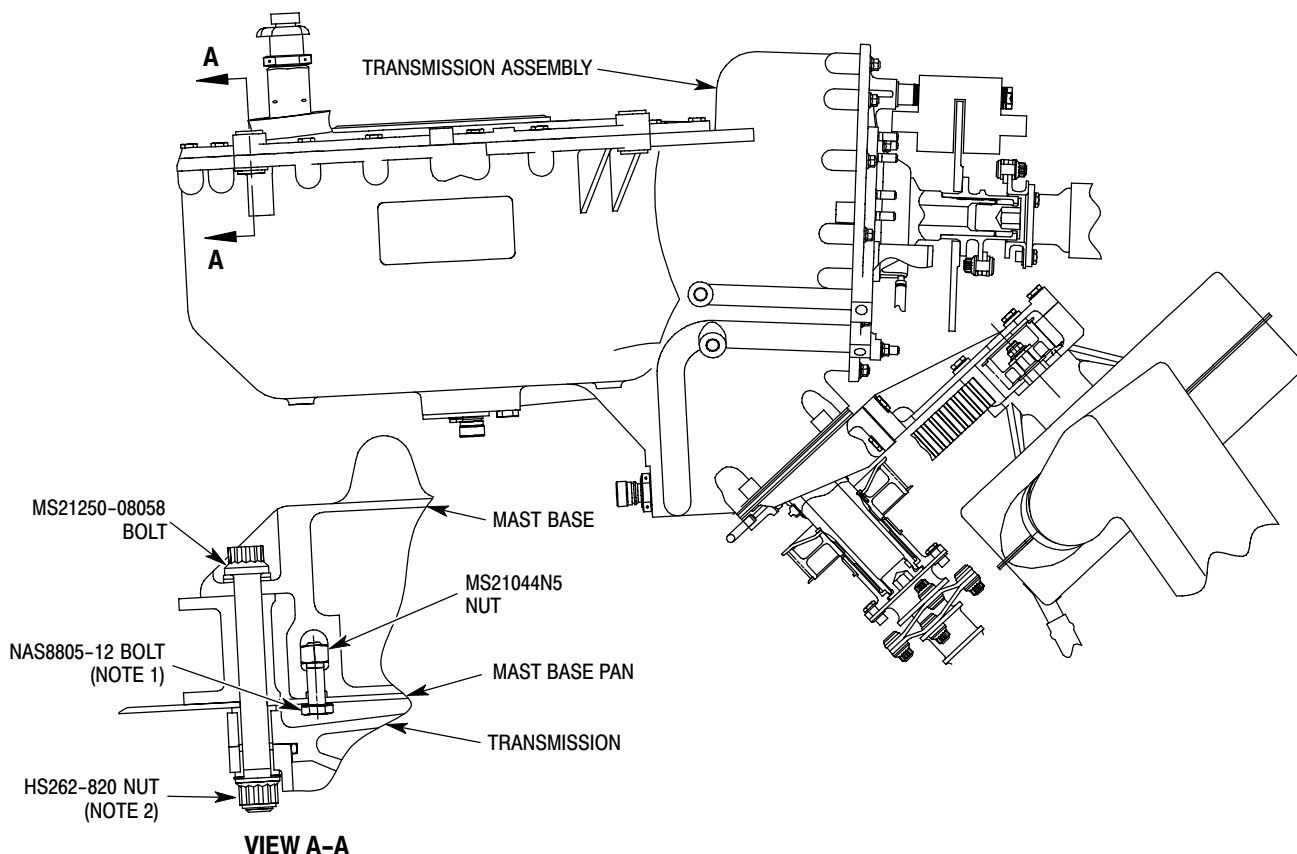
- 1). Remove left-handed main transmission mounting studs from mast support structure pan and mast base.
- 2). Remove left-handed nuts from mast base and install MS21044N5 nuts using original special washers.
- 3). Install NAS6605-11 bolts and torque to **160 - 190 inch-pounds plus drag torque.**
- 4). Using a 0.0010-0.0015 inch feeler gage, check for gap between self-locking nut and special washers. No gap allowed.

- 5). If gap exists, remove nut and replace with new self-locking nut, and repeat above steps.
- b. Remove main rotor mast bolts.
- c. Using existing washers, install MS21250-08058 bolts in mast support holes.
- d. Using a clean absorbent cloth, clean pan beneath main rotor mast support, especially area contacted by O-ring on top of transmission.


NOTE

The following procedure will require the assistance of another person.

- e. With assistance, slowly and evenly lift and position transmission in place on mount bolts.
- f. Install new HS262-820 nuts with existing washers. Torque nuts to **900 - 1100 inch-pounds plus drag torque.**
- g. Drain any residual preservative oil. Service transmission with 14.0 pints of Mobil SHC 626 oil.
- h. Connect wiring to tachometer generator, both chip detectors and oil pressure switch.
- i. If installed, connect rotor brake lines to caliper.

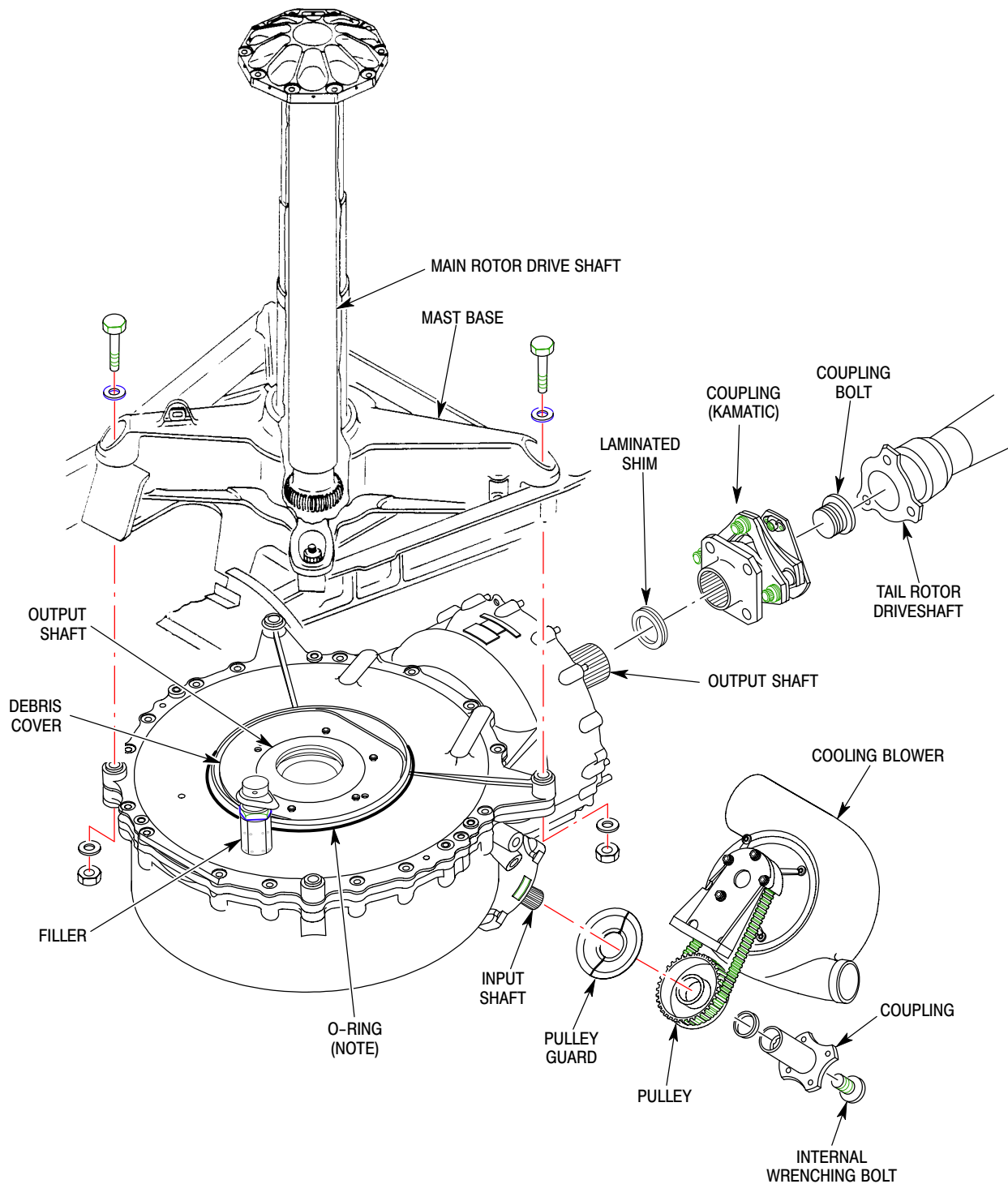


NOTES:

1. TORQUE BOLT TO 160-190 INCH-POUNDS PLUS DRAG TORQUE.
2. TORQUE NUT TO 900-1100 INCH POUNDS PLUS DRAG TORQUE. 

CSP102-011

Figure 2-10. Main Transmission Installation (Sheet 1 of 2)



G63-2032

Figure 2-10. Main Transmission Installation (Sheet 2 of 2)

2-26.Oil Cooler Blower Installation

(Ref. Figure 406)

Expendable Materials Refer to Table 2-1	
Nomenclature	Item
Sealant	2
Grease	4
Anti-seize compound	6
Lockwire	11

- Remove 369D25627 oil cooler fan bracket from blower assembly.
- With belt looped around driven pulley, install 369F5190 oil cooler fan bracket.

NOTE

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

- Install four NAS6604H8 bolts with AN960C416L washers through 369F5190 oil cooler mounting bracket into 369D25626 fan bracket.
- Before tightening bolts, displace cooler toward the transmission flange to eliminate slack in that direction.
- Torque bolts to **70 - 90 inch-pounds**.
- After bolts are torqued, seal around bolt heads with sealant (2, Table 2-1).
- Install pulley guard on main transmission input shaft.
- With belt looped around transmission input shaft, position mounting bracket on main transmission pad and loosely install two NAS6604H6 bolts with AN960C416L washers from the bottom of bracket and two NAS6604H7 bolts with AN960C416L washers from top of bracket.
- Before tightening bolts, insert one 369F5193 shim between bracket and transmission pad.
- Verify that blower scroll clears anti-torque drive shaft by a minimum of 0.190 inch.

- Torque bolts to **65 - 75 inch-pounds** and safety with lockwire (11).



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

- Slide 369F5137 driver pulley onto transmission input shaft to engage belt in teeth of both pulleys.



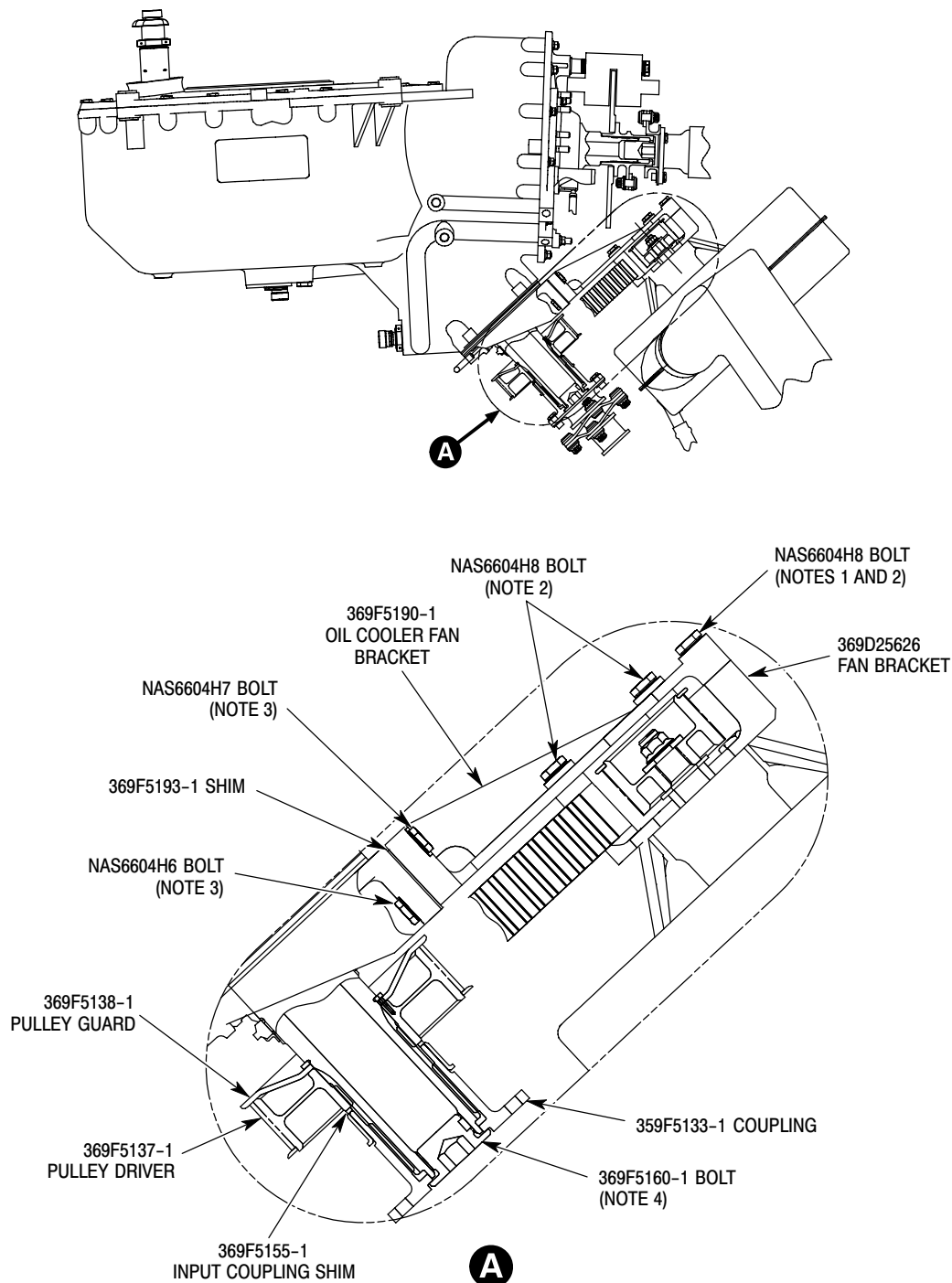
The minimum of 0.010 inch measurement between the bolt seating surface and the input shaft must be obtained to ensure proper clamp-up. Warped shims or foreign material could provide a false 0.010 inch minimum measurement and improper clamp-up could result, which during normal operation, may damage the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

- Coat threads of 369F5160 coupling bolt with anti-seize compound (6).
- Lubricate input shaft splines and 369F5133 coupling splines with grease (4).
- Install 369F5155 input coupling shim and coupling on transmission input shaft with coupling bolt.
- Adjust belt tension (Ref. Sec. 63-21-00, Cooling Blower Belt Tension Check and Adjustment).

NOTE

Check coupling bolt for a minimum of **25 inch-pounds** drag torque.

- Torque coupling bolt to **315 - 365 inch-pounds plus drag torque**.
- Connect drain tube to cooling blower scroll fitting. Clamp tube to fitting with two turns of lockwire (11).
- Roll exhaust duct rubber connectors onto scroll outlets (transmission oil cooler duct and engine oil cooler duct) and secure with tie straps.

**NOTES:**

1. TORQUE BOLTS TO 70-90 INCH-POUNDS.
2. AFTER TORQUING, SEAL BOLT HEADS WITH SEALANT (3, TABLE 201, 91-00-00).
3. TORQUE BOLTS TO 65-75 INCH POUNDS AND SAFETY WITH LOCKWIRE (150).
4. TORQUE COUPLING BOLT TO 315-365 INCH POUNDS PLUS DRAG TORQUE (DRAG TORQUE TO BE NOT LESS THAN 25 INCH-POUNDS).

CSP102-012

Figure 2-1 1. Oil Cooler Blower Installation

2-27.369F5450 Overrunning Clutch

Installation

(Ref. Figure 2-12) The following procedure is for installation of the larger 369F5450 overrunning clutch assembly. This procedure must be accomplished before engine is installed in the helicopter.

Expendable Materials Refer to Table 2-1	
Nomenclature	Item
Grease	4

- a. Remove nuts and washers securing 369A5350 series overrunning clutch assembly to engine power and accessory gearbox; remove clutch assembly with firewall seal and coupling installed.

NOTE

The 369F5450 overrunning clutch comes serviced with 110 cc of oil and with the output drive coupling already installed.

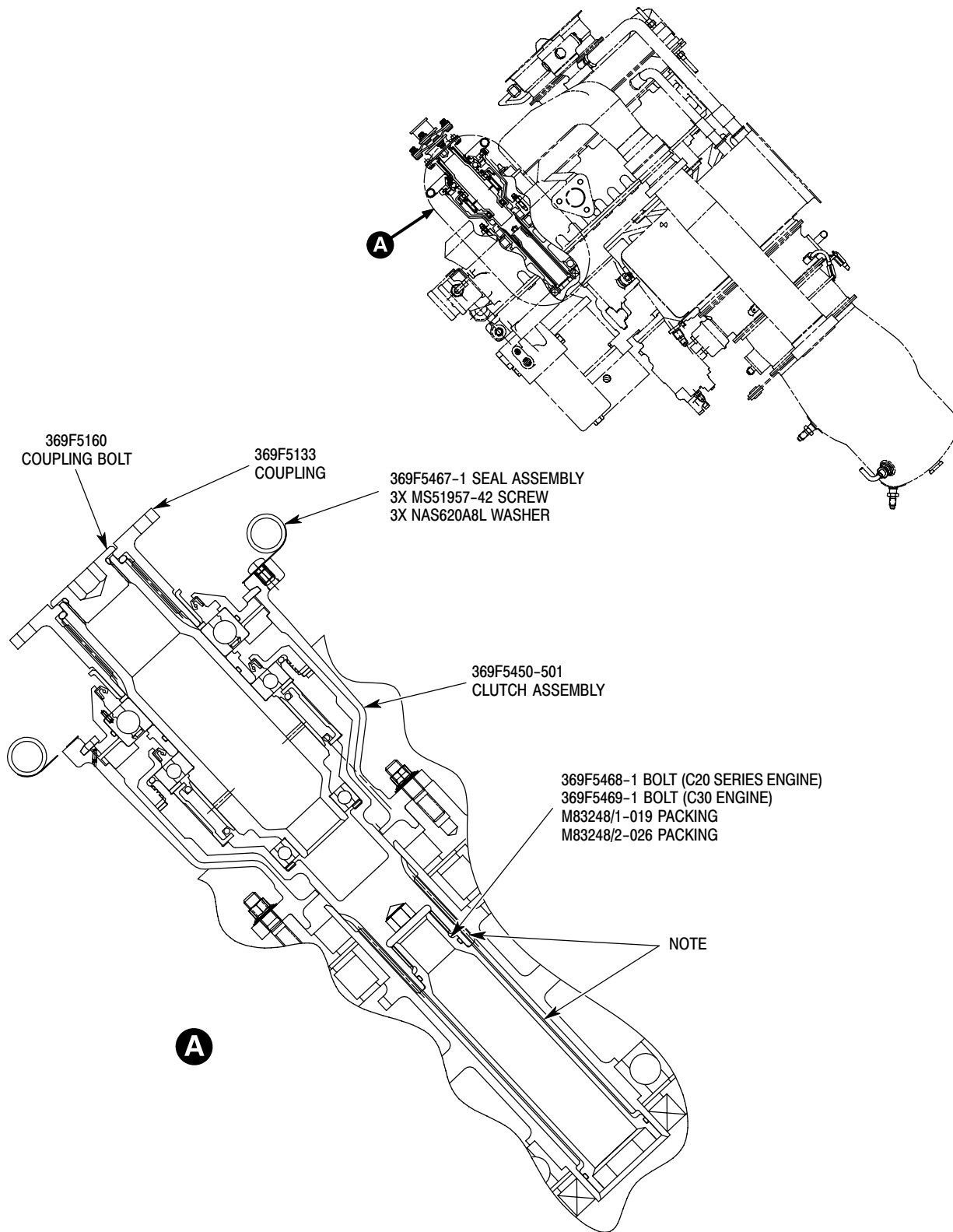
- b. Coat external splines of overrunning clutch and internal splines of engine power and accessory gearbox with grease (4, Table 2-1).

- c. Slide overrunning clutch into engine and secure with six nuts and washers; torque nuts to **15 - 20 Inch-pounds plus drag torque.**
- d. Remove power output shaft cover plate from back of engine (Ref. Sec. 01-00-00, Allison Engine Operation and Maintenance Manual).
- e. Install O-rings on 369F5469 (C30 engine) or 369F5468 (C20 series engines) bolt.

NOTE

Fill all voids and gaps between the outside of bolt and inside of engine shaft with grease.

- f. Lubricate bolt splines and inside of engine output shaft with grease (4) and insert through engine into overrunning clutch assembly.
- g. Insert a 3/8" hex wrench (approximately 10 inches long) thru holding tool and into the bolt. Torque bolt to **250 - 300 inch-pounds plus drag torque.**
- h. Using existing hardware, reinstall power output shaft cover plate on back of engine (Ref. Sec. 01-00-00, Allison Engine Operation and Maintenance Manual).
- i. Position 369F5467 firewall seal assembly on clutch with seam orientated to the six o'clock position. Secure with three MS51957-42 screws and NAS620A8L washers.



NOTE: LUBRICATE SPLINES BEFORE ASSEMBLY WITH GREASE (21, TABLE 201, 91-00-00).
PACK ALL VOIDS AND GAPS BETWEEN THE OUTSIDE OF BOLT AND INSIDE OF ENGINE
POWER OUTPUT SHAFT.

CSP102-013

Figure 2-12. 369F5450 Overrunning Clutch Installation

2-28. Aircraft Reassembly

The following procedure is arranged in logical order for reassembly of the helicopter after modification; install the following:

NOTE

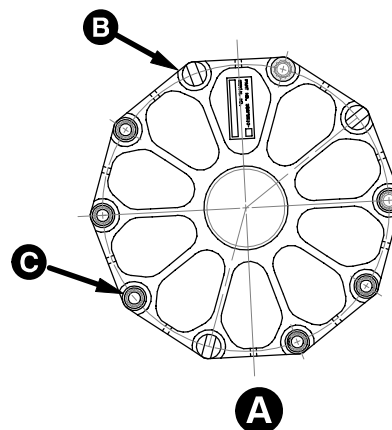
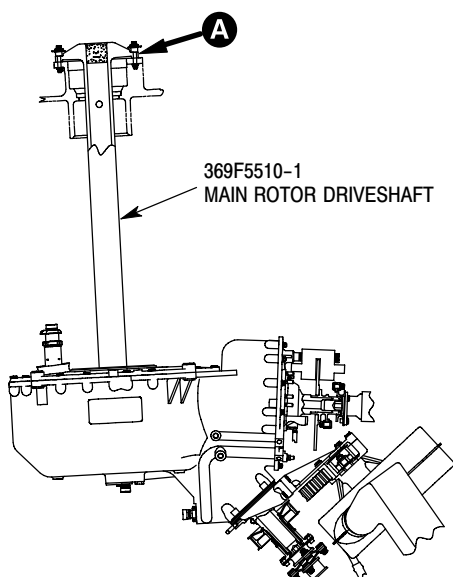
After tunnel-routed control tubes, swashplate and mixer assembly, and main rotor hub are installed, run all controls through full range of travel and inspect for clearance with reworked areas.

- Tunnel-routed control tubes (Ref. Sec. 67-10-00).
- Main rotor swashplate and mixer assembly (Ref. Sec. 62-30-00).
- Main rotor hub (Ref. Sec. 62-20-00).

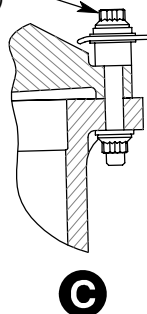
NOTE

If installing the 369F5510 drive shaft, use three 369D21010-3 eyebolts and seven HS5798-4-26 bolts in place of standard hardware (Ref. Figure 2-13).

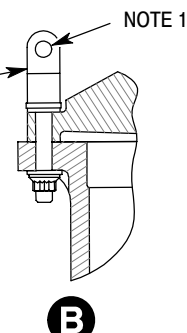
- Main rotor drive shaft (Ref. Sec. 63-10-10).
- Anti-torque drive shaft access screen under intake fairings (Ref. Sec. 52-50-00).
- Anti-torque flight controls on upper deck (Ref. Sec. 67-20-10 or 67-20-30).
- Intake fairings (Ref. Sec. 53-30-00 or 53-30-30).
- Engine and attaching hardware (Ref. Sec. 71-00-00 or 71-00-30).
- Anti-ice cable assembly (if equipped with a 250-C20B engine) (Ref. Sec. 75-10-00).



HS5798-4 BOLT
(NOTE 2)



369D21010-3 EYEBOLT
(NOTE 2)



NOTE:

- HOLES TO BE IN LINE WITH HELICOPTER HOIST SLING.
- TORQUE NUTS TO 120 - 140 INCH-POUNDS PLUS DRAG TORQUE.

CSP102-014

Figure 2-13. 369F5510 Main Rotor Drive Shaft Installation

- j. Install 369A5000-40101 alignment tool between engine and transmission (Ref. Figure 2-14) and check for maximum total offset of 0.050 inch and total maximum wobble of 0.100 inch. If not within these limits, perform engine alignment (Ref. CSP-SRM-6).
- k. Check overrunning clutch assembly oil level.



When installing the main transmission drive shaft, use NAS6604-5 bolts.

NOTE

NAS1304 bolts can be used in place of NAS6604 bolts.

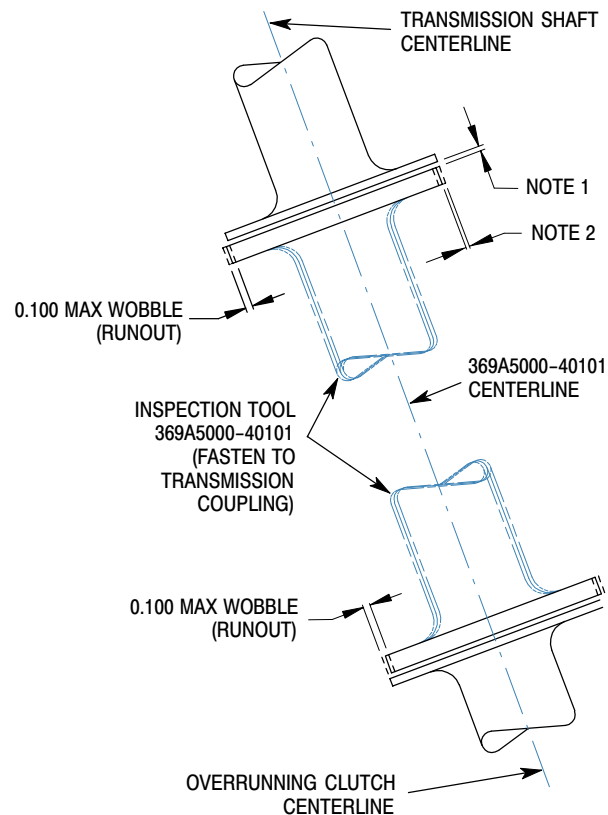
- l. Main transmission drive shaft (Ref. Sec. 63-10-00).
- m. Tailboom assembly (Ref. Sec. 53-40-00 or 53-40-30).
- n. Horizontal and vertical stabilizers (Ref. Sec. 53-50-10 or 53-50-30).
- o. Tail rotor control rod assembly (369D/E/FF) (Ref. Sec. 67-20-10).
- p. Tail rotor gearbox and drive shaft (369D/E/FF) (Ref. Sec. 63-15-10).
- q. Tail rotor assembly (369D/E/FF) (Ref. Sec. 64-20-00).
- r. Sta. 124.00 bulkhead panels (Ref. Sec. 25-30-00).

NOTE

- For replacement interior panels, contact:
Custom Aircraft Interiors
3701 Industry Ave.
Lakewood, CA 90712
- The following is a list of panels that must be replaced with new panels when installing the 369F5100 transmission (Ref. Section 1).

Panels to Remove	Panels to Install
369D26542 Baffle Assy.	H5-5100-134 Baffle Assy.
369D26543-1 1 Seal Assy. L/H	H5-5100-121 Seal Assy. L/H
369D26543-21 Seal Assy. R/H	H5-5100-122 Seal Assy. R/H
369D22070 Blower Access Door Assy.	H5-5100-103 Driveline Cover

- s. All interior trim and insulation in cargo compartment.
- t. For 500N Model helicopters only:
 - 1). Locate and mark HS-5100-134 panel for grommet hole (Ref. Figure 2-15).
 - 2). Cut 0.812 hole in panel.
 - 3). Install MS35489-14 grommet.
- u. Main rotor blades (Ref. Sec. 62-10-00).

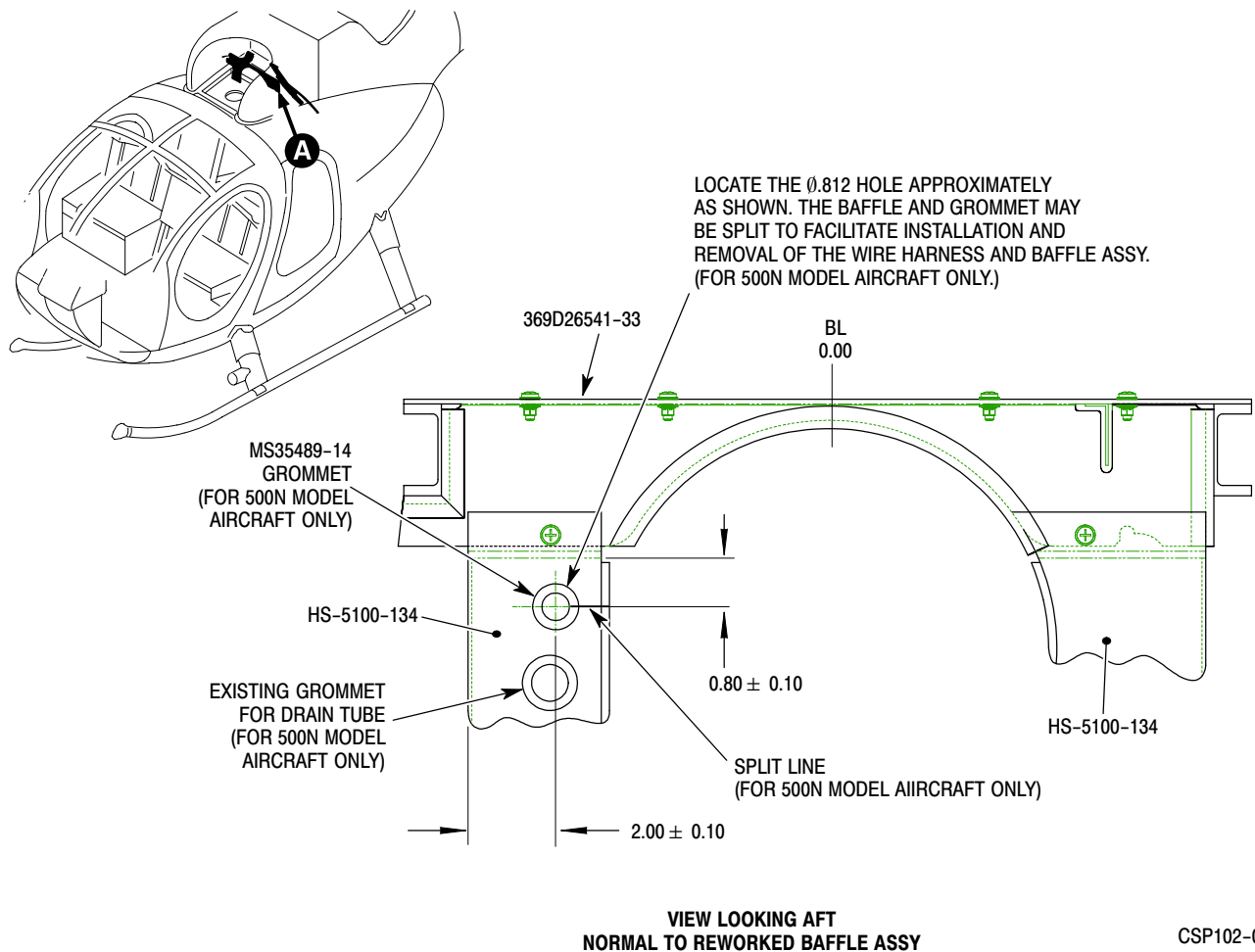


NOTES:

1. WHEN INSTALLING DRIVESHAFT, PEEL SHIM TO OBTAIN +0.010/-0.020 AXIAL FIT.
2. 0.050 MAX AVERAGE OFFSET AT THE COUPLING FLANGE WITH THE LARGEST MISMATCH (OFFSET) WHEN ROTATING TOOL ONE FULL TURN (360°) 2 PL

CSP102-015

Figure 2-14. Main Transmission Drive Shaft
Runout Check



CSP102-018

Figure 2-15. HS-5100-134 Baffle Assembly Modification

2-29. Expendable Materials

Materials in Table 2-1 are approved for use on all Models of MDHS helicopters. Do not use substi-

tute materials unless material is of equal quality and grade. See notes at end of Table 2-1.

Table 2-1. Expendable Materials

Commercial Product (2)				
Item No.	Material	Specification No. (1)	Name/No	Manufacturer
(See footnotes at end of table)				
1	Solvent, dry-cleaning	P-D-680	(3)	
2	Sealing compound	MIL-S-8802	890	Coast Proseal Compton CA
		MIL-S-8516 Class II	3C-3007	Churchill Chemical Corp. Los Angeles, CA
			PR1422 A1/2 Type I	Product Research 2919 Empire Avenue Burbank, CA 91504

Table 2-1. Expendable Materials

Item No.	Material	Specification No. (1)	Commercial Product (2)	
			Name/No	Manufacturer
			RTV 730 Type I, Class	Dow Corning Midland, MI
3	Primer	MIL-P-8585	(3)	
4	Grease	MIL-G-81322	Mobil Grease 28 Aero Shell 22	Mobil Oil Company Shell Oil Company
5	Tape, Pressure sensitive (width and thickness as noted)	PPP-T-66 Type I, Class A	Scotch Cal #471 VEF	3M Co. St. Paul, MN 55144
6	Antiseize compound, high temperature	MIL-A-907 / MIL-L-25861	Silicone DC-550R	Dow Corning Corp. Midland, MI 48686-0994
7	Adhesive, bonding, vulca- nized (synthetic rubber to steel)	MIL-A-1 154	EC1300L	3M Co. St. Paul, MN 55144
8	Adhesive (epoxy)	HMS16-1068 Class 1	EA9330.3	Hysol Division Dexter Corporation Pittsburg, CA
9	Cement		Grip	Talor Industries City of Industry, CA
10	Epoxy primer Catalyst reducer		1-1G-69 1-1H-75	Advance Coating and Chemicals
11	Lockwire, CRES (0.032 inch-diameter)		(3)	
12	Thread sealant		P412	Permacel
13	Epoxy cement	Hughes HP16-1	Type II EC 1300L	Dow Corning Corp Midland, MI 48686-0994
14	Acrylic, lacquer (color #'s as noted 20371 - parchment, 34151 - green; FED-STD-595)	HMS 15-1100	(3)	Advance Coating and Chemicals

NOTES:

- (1) Numbers are U.S.A. Specifications and Standards. Prefix symbols are defined as follows: AMS - American Materials Standards; MS - Military Standards; MIL - Military Specification; Single, Double or triple alpha prefix of same letter - Federal Specification; AN - Air Force - Navy Aeronautical Standard; NAS - National Aerospace Standard.
- (2) Primary selection. Any equivalent material may be used as an alternate selection.
- (3) Use best comparable grade material when conformity of available materials of same type with listed Specification No. cannot be determined.