STANDARD OVERHAUL PRACTICES MANUAL

FLUID SYSTEM FITTING TORQUE VALUES

PART NUMBER
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STANDARD OVERHAUL PRACTICES MANUAL

Revision No. 6
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To: All holders of FLUID SYSTEM FITTING TORQUE VALUES 20-50-00.

Attached is the current revision to this STANDARD OVERHAUL PRACTICES MANUAL

The STANDARD OVERHAUL PRACTICES MANUAL is furnished either as a printed manual, on microfilm, or digital products, or any combination of the three. This revision replaces all previous microfilm cartridges or digital products. All microfilm and digital products are reissued with all obsolete data deleted and all updated pages added.

For printed manuals, changes are indicated on the List of Effective Pages (LEP). The pages which are revised will be identified on the LEP by an R (Revised), A (Added), O (Overflow, i.e. changes to the document structure and/or page layout), or D (Deleted). Each page in the LEP is identified by Chapter-Section-Subject number, page number and page date.

Pages replaced or made obsolete by this revision should be removed and destroyed.

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Location of Change	Description of Change
20-50-00	
PGBLK 20-50-00-0	Added details to help you find the torque of hydraulic fittings.

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STANDARD OVERHAUL PRACTICES MANUAL

A = Added, R = Revised, D = Deleted, O = Overflow

TABLE OF CONTENTS

All revisions to this manual will be accompanied by transmittal sheet bearing the revision number. Enter the revision number in numerical order, together with the revision date, the date filed and the initials of the person filing.

Revision		Filed		Revision		Filed	
Number	Date	Date	Initials	Number	Date	Date	Initials

Revision		Filed		Revision		Filed	
Number	Date	Date	Initials	Number	Date	Date	Initials

STANDARD OVERHAUL PRACTICES MANUAL

All temporary revisions to this manual will be accompanied by a cover sheet bearing the temporary revision number. Enter the temporary revision number in numerical order, together with the temporary revision date, the date the temporary revision is inserted and the initials of the person filing.
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Temporary Revision		Inserted		Removed	
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Temporary Revision		Inserted		Removed	
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INTRODUCTION

1. General

A. The instructions in this manual tell how to do standard shop procedures during maintenance functions from simple checks and replacement to complete shop-type repair.

B. This manual is divided into separate sections:

(1) Title Page

(2) Transmittal Letter

(3) Highlights

(4) Effective Pages

(5) Contents

(6) Revision Record

(7) Record of Temporary Revisions

(8) Introduction

(9) Procedures

C. Refer to SOPM 20-00-00 for a definition of standard industry practices, vendor names and addresses, and an explanation of the True Position Dimensioning symbols used.

D. The data is general. It is not about all situations or specific installations. Use it as a guide to help you write minimum standards.

E. If the component overhaul instructions are different from the data in this subject, use the component overhaul instructions.

FLUID SYSTEM FITTING TORQUE VALUES

1. INTRODUCTION

A. The data in this subject comes from Boeing Process Specifications BAC5001-6, BAC5001-7, BAC5001-9 and BAC5001-10. The airline has a copy of the Boeing Process Specification Manual.

B. The data is general. It is not about all situations or specific installations. Use this data to help you write minimum requirements.

C. Refer to SOPM 20-00-00 for a full list of all the vendor names and addresses.

2. GENERAL

A. Refer to the overhaul instructions for the approved lubricant for the threads. If the overhaul instructions do not give the lubricant, refer to BAC5001-6, Table 1.

B. Lubricate O-rings and gaskets by the overhaul instructions or BAC5506 (SOPM 20-50-06).

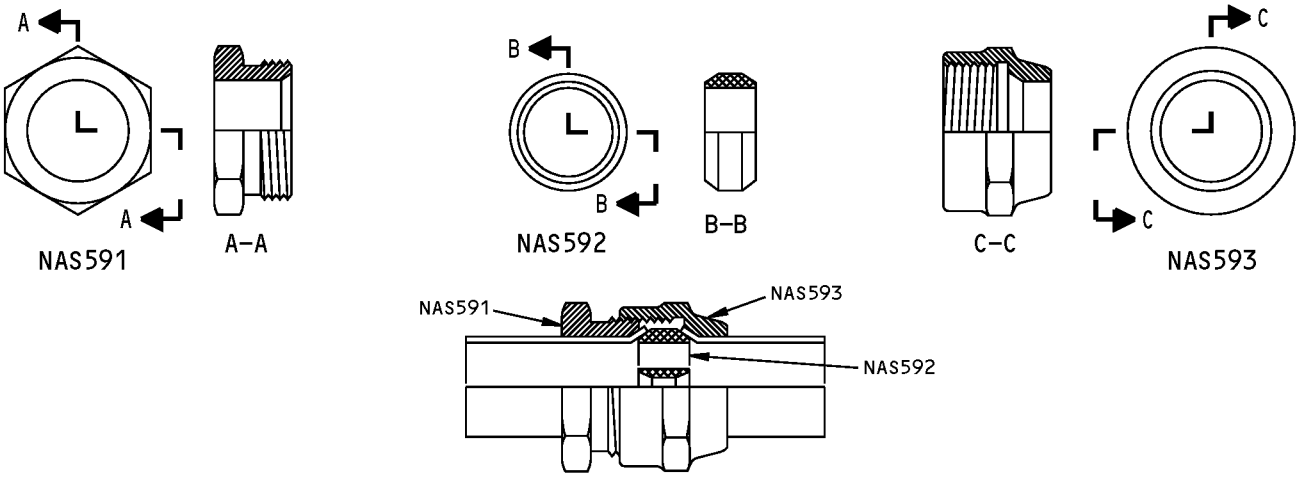
C. Install and tighten the fittings, couplings or clamps by standard industry practices, the overhaul instructions, and the instructions in BAC5001-6, BAC5001-7, BAC5001-9 and BAC5001-10, as applicable.

D. Use the torque values as specified by the overhaul instructions. If the overhaul instructions do not give the torque or tell you to tighten to standard torque, use the torque values shown in Figure 1 thru Figure 4. To help you find the torque for hydraulic fittings such as unions, reducers, valves and plugs, use these guidelines:

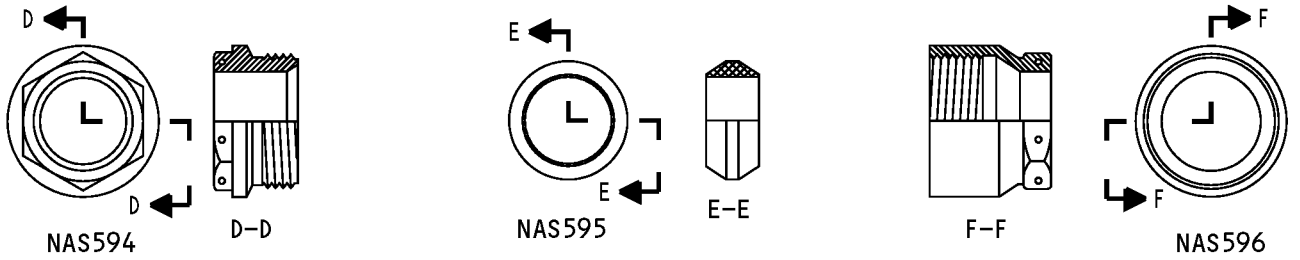
(1) Find the thread size of the fitting. This can be measured on the actual part, or identify the fitting part number and refer to the part specification or standard, which will give the thread size and the related tube size (which can be part of the fitting part number).

(2) Find the material of the fitting, and also of the mating part (the part with the threaded hole). If the materials of the fitting and the mating part are different, note the softer material, such as aluminum compared to steel or titanium. For the purposes of this analysis, consider steel and titanium to have the same hardness.

(3) Find the torque in Figure 1, Figure 2, Figure 3 or Figure 4 for the noted material and thread size or tube size.



CONNECTION ASSEMBLY FOR ALUMINUM ALLOY FITTINGS
NAS591–NAS593



CONNECTION ASSEMBLY FOR STAINLESS STEEL FITTINGS
NAS594–NAS596

Standard Torque Values for Rigid Tube Coupling Connectors
Figure 1 (Sheet 1 of 2)

TUBE OD (INCHES)	TORQUE (POUND-INCHES) (REF BAC5001-9 TABLE II)			
	ALUMINUM ALLOY FITTINGS NAS591-NAS593		STAINLESS STEEL FITTINGS NAS594-NAS596 AND BACN10HX	
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
1/4	48	96	60	96
5/16	60	108	66	108
3/8	72	120	72	120
1/2	120	216	144	216
5/8	144	360	204	348
3/4	216	530	300	530
1	480	720	480	720
1-1/4	600	900	600	900
1-1/2	600	900	600	900
2	900	1200	900	1200
2-1/2	1500	1800	1800	2100
3	--	--	1800	2100
4	--	--	2400	2700

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Standard Torque Values for Rigid Tube Coupling Connectors
Figure 1 (Sheet 2 of 2)

PIPE THREAD SIZE (INCHES)	TORQUE (POUND-INCHES) (REF BAC5001-6 TABLE II)			
	MATING PIPE FITTING MATERIAL COMBINATIONS			
	ALL BUT CRES TO CRES		CRES TO CRES	
	MIN	MAX	MIN	MAX
1/8	100	175	100	150
1/4	150	300	100	275
3/8	225	450	100	400
1/2	—	—	100	500
3/4	—	—	150	600
1	—	—	200	800

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Standard Torque Values for Fittings with Pipe Threads
Figure 2

TUBE END MATERIAL	END FITTING CONFIGURATION	TABLE	TORQUE COLUMN	REF BAC5001		TOL ± %
				-6 TABLE	-10 TABLE	
ALUMINUM	FLARED	B	1	III		10
ALUMINUM 6061-T6 (MIL-T-7081)	PRESET SLEEVES BACS13AP	C	-		III	5
ALUMINUM	SWAGED SLEEVES BACS13BD	B	1		III	5
CRES SUCH AS 21-6-9 (BMS 7-185)	SWAGED SLEEVES BACS13BD, BACS13BX	B	2		II	5
CRES, 1/8 HARD MIL-T-6845	FLARED	B	2	III		10
	PRESET SLEEVES BACS13AP	C	-		III	5
CRES, ANNEALED 1 MIL-T-8504 MIL-T-8606 MIL-T-8808	FLARED	B	2	III		10
	PRESET SLEEVES BACS13AP	C	-		III	5
TITANIUM 3AL-2.5V (BMS 7-234)	ALL	B	2		II	5
ALL	FLARED HOSE ENDS WITH ALUMINUM INSERTS	B	3		IV	5
ALL	FLARELESS HOSE ENDS WITH ALUMINUM TUBE INSERTS	B	1		III	5
ALL	FLARELESS HOSE ENDS WITH CRES TUBE INSERTS	B	2		II	5
ALUMINUM BOSSES	ALUMINUM, STEEL OR TITANIUM FITTINGS	B	1		III	5
STEEL OR TITANIUM BOSSES	STEEL OR TITANIUM FITTINGS	B	2		II	5

TABLE A

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Standard Torque Values for Tube Assemblies and Tube Fittings
Figure 3 (Sheet 1 of 2)

TUBE OD (INCHES)	TUBE SIZE CODE	TORQUE (POUND-INCHES) ±5 PERCENT		
		COLUMN 1	COLUMN 2	COLUMN 3
1/8	02	--	--	--
3/16	03	80	100	35
1/4	04	110	140	65
5/16	05	140	190	90
3/8	06	170	270	130
1/2	08	280	500	260
5/8	10	360	700	360
3/4	12	450	900	500
7/8	14	--	--	--
1	16	750	1200	700
1-1/4	20	900	1600	900
1-1/2	24	900	2000	900
1-3/4	28	--	--	--
2	32	--	2000	2000

TABLE B

TUBE OD (INCHES)	TUBE SIZE CODE	MATERIAL		WALL THICKNESS (INCH)	TORQUE (POUND-INCHES) ±5 PERCENT
		AL	ANNEALED CRES 1		
1/8	02	-	-	--	--
3/16	03	X	X	0.028	80
1/4	04	X	X	0.028	110
5/16	05	X	X	0.028	140
3/8	06		X	0.020	160
		X	X	0.028	170
1/2	08	X	X	0.028	280
			X	0.035	550
5/8	10		X	0.020	250
		X	X	0.028	360
			X	0.035	450
			X	0.049	450
3/4	12		X	0.020	325
		X	X	0.028	450
7/8	14	-	-	--	--
1	16	X	X	0.035	750

TABLE C

1 ANNEALED CRES TUBING HAS A WIDE YELLOW BAND NEAR THE IDENTIFICATION-CODE MARKINGS

Standard Torque Values for Tube Assemblies and Tube Fittings
Figure 3 (Sheet 2 of 2)

CLAMP PART NUMBER	DASH NUMBER ( )	TORQUE (POUND-INCHES) (REF BAC5001-9 TABLE VII, PSD 6-16 TABLE A)
BACC10AC()	150-200	40-50
	225-300	60-70
	315-550	120-140
BACC10AU()	125-225	25-30
	250-275	70-75
	300-600	100-105
BACC10BR8()	100-900	100-105
BACC10CT2()	100-600	100-105
BACC10DP()A	150-250	50-55
BACC10DP()B	300	50-55
BACC10DP()AB	350-400	50-55
	450-600	70-75
BACC10DU()AB	100-175	50-55
	200-275	55-60
	300-450	60-65
	500-600	65-70
	700-1000	75-80
BACC10EY()B	150-800 1	105-110
	150-400 2	75-80
	425-800 2	105-110
BACC10EZ()B	125-275 1	75-80
	300 1	105-110
	125-300 2	105-110
BACC10GY()	150-175	40-45
	200-275	45-50
	300-450	50-55
	475-600	55-60
	650-900	65-70
BACC10HX()	100-300	10-15
	325-500	15-20
	550-800	20-25
BACC10KH()	200-275	45-50
	300-475	55-60
	500-550	60-65
	600-650	65-70
	700	70-75

TABLE A

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Standard Torque Values for Clamps
Figure 4 (Sheet 1 of 2)

CLAMP PART NUMBER	DUCT OR HOSE OD (INCHES)	TORQUE (POUND-INCHES) (REF BAC5001-9 TABLE I)
BACC10AD	2.00-8.00	20-25
BACC10BN	1.75-20.00	20
BACC10CT	1.00-6.00	100-105 3
BACR12H ROYLYN COUPLINGS	1.50 4	600-1000
	1.50 5	900-1200
	1.75 4	900-1200
	2.00 4	1300-2500
	2.50 4	2000-3000

TABLE B

CLAMP PART NUMBER	DASH NUMBER	TORQUE (POUND-INCHES (REF BAC5001-9)
BACC10ET	ALL	30-35, 40 MAX 7
BACC10FY	ALL	30-35, 40 MAX 7
BACC10Q	ALL	20-30 8
BACC10GW	ALL	40 MAX 6 8
BACC10HN	ALL	40 MAX 6 8

TABLE C

1 AEROQUIP (V00624, V8W928, V98625) CLAMPS ONLY

2 JANITROL (V89513) CLAMPS ONLY

3 INSIDE OF COUPLING NOT LUBRICATED

4 ALUMINUM COUPLINGS ONLY

5 CRES COUPLINGS ONLY

6 SEE OVERHAUL INSTRUCTIONS FOR THE TORQUE. IT COULD BE A FUNCTION OF DUCT MATERIAL AND SIZE.

7 BASED ON THE BOEING PART STANDARD FOR THE CLAMP

8 BASED ON PSD 6-16 TABLE A

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Standard Torque Values for Clamps
Figure 4 (Sheet 2 of 2)