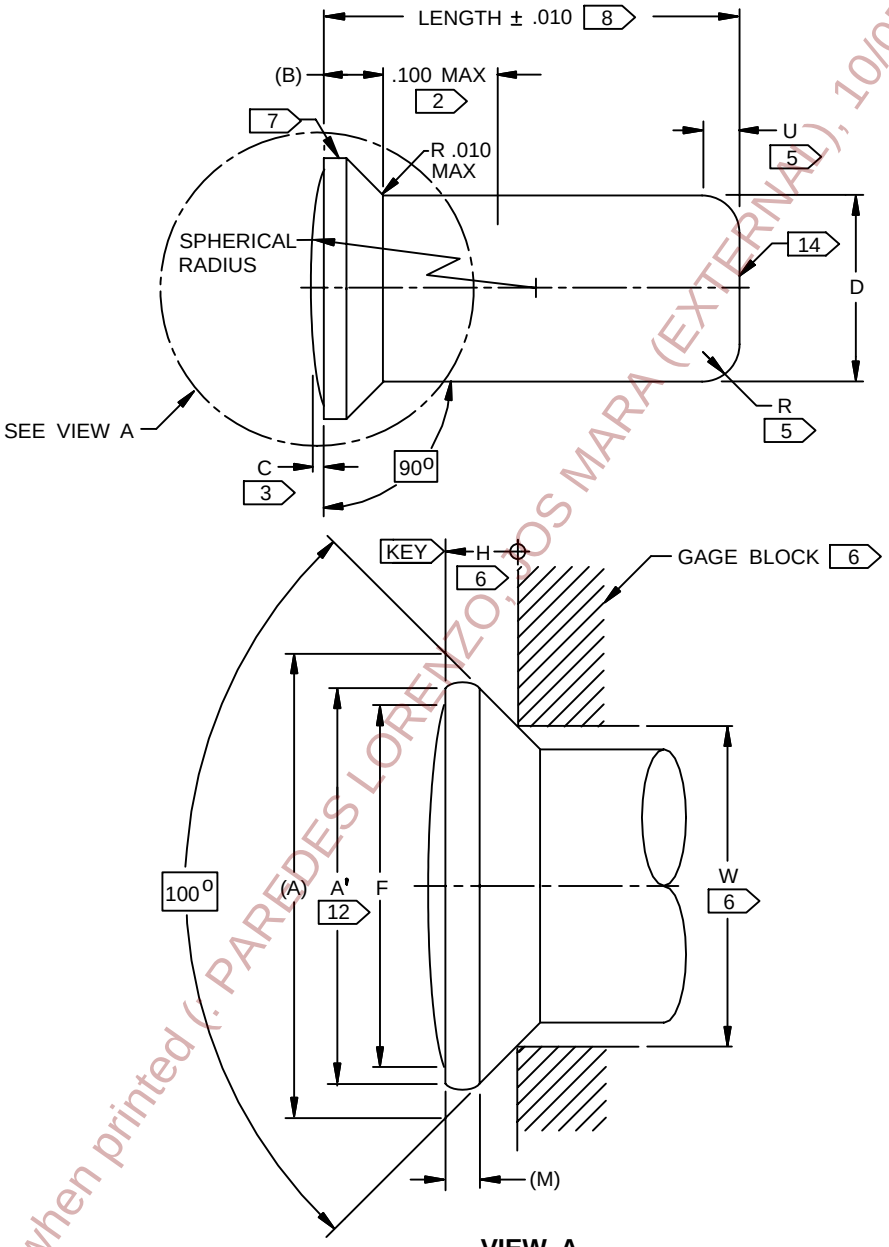
BCAG	F	BD&SG	F	BH	N						

NEW DESIGN APPROVAL: P=PARTIAL, F=FULL, N=NONE



VIEW A

DIMENSIONING AND TOLERANCING PER ANSI Y14.5M–1982.
DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED.
DIMENSIONS APPLY AFTER FINISH UNLESS OTHERWISE SPECIFIED.

TECHNICAL CHANGES IDENTIFIED BY REVISION BAR.

TABLE I DIMENSIONS, NOMINAL SIZE (11)

BOEING STANDARD NUMBER BACR15GF (4)	NOM SIZE	∅ A (REF) TO SHARP CORNER (1) (9)		∅ A′ (12)			B HEAD HEIGHT (9)		C ±.001 (3)	∅ D ±.001 (2)
		LMC	MMC	MIN	NOM	MAX	MMC	LMC		
3	.0938	.1449	.1471	.1320	.1340	.1360	.0219	.0218	.004	.094
4	.1250	.1919	.1941	.1780	.1800	.1820	.0282	.0281	.004	.126
5	.1563	.2447	.2469	.2310	.2330	.2350	.0373	.0372	.006	.157
6	.1875	.2948	.2970	.2810	.2830	.2850	.0453	.0452	.006	.188
8	.2500	.3929	.3951	.3790	.3810	.3830	.0600	.0600	.006	.251
10	.3125	.4862	.4884	.4680	.4700	.4720	.0732	.0731	.006	.313

TABLE I DIMENSIONS, NOMINAL SIZE (CONTINUED) (11)

BOEING STANDARD NUMBER BACR15GF (4)	∅ F (3)		H (KEY) GAGE PROTRUSION (6)			M (9)		U +.000 −.010	R RAD ±.010
	MIN	MAX	MIN	NOM	MAX	LMC	MMC		
3	.086	.096	.0108	.0113	.0118	.0054	.0047	.023	.029
4	.138	.148	.0121	.0126	.0131	.0058	.0051	.030	.039
5	.190	.200	.0141	.0146	.0151	.0058	.0050	.039	.049
6	.198	.208	.0213	.0218	.0223	.0058	.0050	.047	.059
8	.316	.326	.0258	.0263	.0268	.0058	.0051	.062	.078
10	.400	.410	.0342	.0347	.0352	.0076	.0069	.078	.098

TABLE I DIMENSIONS, NOMINAL SIZE (CONTINUED) (11)

BOEING STANDARD NUMBER BACR15GF (4)	∅ W GAGE (6)		SHEAR STRENGTH IN POUNDS	
	MIN	MAX	SINGLE MIN	DOUBLE MIN
3	.1190	.1192	257	489
4	.1629	.1631	464	884
5	.2109	.2111	722	1376
6	.2438	.2440	1038	1977
8	.3312	.3314	1802	3534
10	.4045	.4047	2807	5505

TABLE II DIMENSIONS, .0312 OVERSIZE 10

BOEING STANDARD NUMBER BACR15GF 4	NOM SIZE	∅ A (REF) TO SHARP CORNER 1 9		∅ A′ 12			B HEAD HEIGHT 9		C ±.001 3	∅ D ±.001 2
		LMC	MMC	MIN	NOM	MAX	MMC	LMC		
7	.2188	.3278	.3300	.3140	.3160	.3180	.0453	.0452	.006	.221
9	.2813	.4259	.4281	.4120	.4140	.4160	.0600	.0600	.006	.284

TABLE II DIMENSIONS, .0312 OVERSIZE (CONTINUED) 10

BOEING STANDARD NUMBER BACR15GF 4	∅ F 3		H KEY GAGE PROTRUSION 6			M 9		U +.000 – .010	R RAD ±.010
	MIN	MAX	MIN	NOM	MAX	LMC	MMC		
7	.234	.244	.0351	.0356	.0361	.0058	.0050	.055	.069
9	.359	.369	.0396	.0401	.0406	.0058	.0051	.055	.069

TABLE II DIMENSIONS, .0312 OVERSIZE (CONTINUED) 10

BOEING STANDARD NUMBER BACR15GF 4	∅ W GAGE 6		SHEAR STRENGTH IN POUNDS	
	MIN	MAX	SINGLE MIN	DOUBLE MIN
7	.2438	.2440	1436	2737
9	.3312	.3314	2309	4529

TABLE III DIMENSIONS .0156 OVERSIZE 13 15

BOEING STANDARD NUMBER BACR15GF 4	NOM SIZE	∅ A (REF) TO SHARP CORNER 1 9		∅ A′ 12			B HEAD HEIGHT 9		C ±.001 3	∅ D ±.001 2
		LMC	MMC	MIN	NOM	MAX	MMC	LMC		
61	.2031	.3098	.3120	.2960	.2980	.3000	.0453	.0452	.006	.203
81	.2656	.4080	.4100	.3942	.3961	.3979	.0600	.0600	.006	.266

TABLE III DIMENSIONS .0156 OVERSIZE (CONTINUED) 13 15

BOEING STANDARD NUMBER BACR15GF 4	∅ F 3		H KEY GAGE PROTRUSION 6			M 9		U +.000 – .010	R RAD ±.010
	MIN	MAX	MIN	NOM	MAX	LMC	MMC		
61	.215	.225	.0276	.0281	.0286	.0058	.0050	.055	.069
81	.335	.345	.0321	.0326	.0331	.0058	.0051	.055	.069

TABLE III DIMENSIONS .0156 OVERSIZE (CONTINUED) 13 15

BOEING STANDARD NUMBER BACR15GF 4	∅ W GAGE 6		SHEAR STRENGTH IN POUNDS	
	MIN	MAX	SINGLE MIN	DOUBLE MIN
61	.2438	.2440	1211	2307
81	.3312	.3314	2025	3971

NOTES

1 NO PORTION OF THE RIVET HEAD SHALL BE PERMITTED TO EXTEND BEYOND THE ENVELOPE OF PERFECT FORM AT MAXIMUM MATERIAL CONDITION (MMC) AND THUS BE OUTSIDE THE TOLERANCE ZONE SPECIFIED. NO PORTION OF THE RIVET HEAD SHALL BE PERMITTED TO EXTEND BEYOND THE ENVELOPE OF PERFECT FORM AT LEAST MATERIAL CONDITION (LMC) AND THUS BE OUTSIDE THE TOLERANCE ZONE SPECIFIED.

2 HOLD “D” DIAMETER TOLERANCE TO WITHIN .100 MAXIMUM OF BASE OF HEAD; A .0005 INCREASE IN THE “D” DIAMETER IS PERMISSIBLE WITHIN .100 MAXIMUM OF BASE OF HEAD.

3 “C” DIMENSION IS THE HEIGHT OF THE SPHERICAL SURFACE OF THE RIVET HEAD. THE SPHERICAL RADIUS MUST BLEND INTO THE TOP OF THE HEAD AT DIAMETER “F”.

4 SEE CODING SECTION UNDER “USAGE AND APPLICATION INFORMATION” FOR COMPLETE BOEING PART NUMBER.

NOTES (CONTINUED)

5 RIVET SHANK END MAY BE SQUARE OR RADIUSED. DIMENSIONS “U” AND “R” APPLY TO RADIUSED END RIVETS ONLY.

6 HEAD PROTRUSION MEASUREMENT IN ACCORDANCE WITH D–11805, INSPECTION METHOD A.

7 CURVED EDGE OPTIONAL PROVIDED THAT MEASURED A′ IS GREATER THAN THE TABULATED MINIMUM VALUES FOR A′.

8 TO DETERMINE THE NOMINAL LENGTH, MULTIPLY THE SECOND DASH NUMBER BY .0625 AND, WHEN CODE R5 IS SPECIFIED, ADD .0312. TABLE IV LISTS STANDARD LENGTHS. LENGTHS OTHER THAN THOSE LISTED MAY BE ORDERED BY USE OF THE APPROPRIATE DASH NUMBER (SEE CODING SECTION).

9 “A”, “B” AND “M” ARE THEORETICAL LIMITS AND ARE INCLUDED ONLY FOR ENGINEERING REFERENCE PURPOSES. IF DIMENSIONS A′ AND H ARE WITHIN THE ENVELOPE DEFINED BY THE LIMITS AT MMC AND LMC, THEN DIMENSIONS B AND M ARE ACCEPTABLE. “A”, “B” AND “M” ARE CALCULATED LIMITS RESULTING FROM TOLERANCES ON A′, D, H, W AND HEAD ANGLE.

10 RIVET SIZES LISTED IN TABLE II (.0312 OVERSIZE) INTENDED FOR REPAIR USE ONLY, MAY ALSO BE USED FOR DESIGN PURPOSES, AS REQUIRED.

11 SEE TABLE II FOR DIMENSIONS FOR .0312 OVERSIZE RIVETS.

12 HEAD DIAMETER A′, IS A QUALITY CHARACTERISTIC, BUT CENTERING OF PROCESS WITHIN SPECIFIED LIMITS IS NOT REQUIRED.

13 .0156 OVERSIZE RIVETS SHALL BE DESIGNATED WITH A “1” FOLLOWING THE NOMINAL SIZE (EXAMPLE: 61 INDICATES A .1875 + .0156 DIAMETER).

14 .0156 OVERSIZE RIVETS SHALL BE MARKED WITH AN INDENTED DIMPLE .010 DEEP MAXIMUM BY .030 DIAMETER MAXIMUM IN THE SHANK END OF THE RIVET.

15 RIVET SIZES LISTED IN TABLE III (.0156 OVERSIZE) ARE FOR REPAIR USE ONLY AND SHALL NOT BE USED FOR DESIGN PURPOSES.

16 PARTS MANUFACTURED AFTER MARCH 31, 2003 SHALL HAVE THE SOL GEL OVER CONVERSION COAT FINISH. PARTS FINISHED ONLY WITH CHEMICAL CONVERSION COAT PER MIL–C–5541, CLASS 1A, CLEAR, COLORLESS MAY BE PROCURED AND USED UNTIL STOCKS ARE DEPLETED.

17 AEROSPACE RIVET MANUFACTURERS CORPORATION IS NO LONGER IN BUSINESS. RIVETS MANUFACTURERS BY THE AEROSPACE RIVET MANUFACTURERS CORPORATION PRIOR TO MAY 1, 2002 MAY BE RECEIVED UNTIL MAY 1, 2006 PROVIDED THE ORIGINAL AEROSPACE RIVET MANUFACTURERS CORPORATION DATA CERTIFICATIONS ACCOMPANY ALL SHIPMENTS WITH AN AEROSPACE RIVET MANUFACTURERS CORPORATION (ALLFAST FASTENING SYSTEMS INC.) CERTIFICATE OF COMPLIANCE.

TABLE IV DASH NUMBERS FOR STANDARD RIVET LENGTHS 8

BOEING STANDARD NUMBER BACR15GF 4	NOMINAL RIVET LENGTH								
	.1562	.1875	.2500	.3125	.3750	.4375	.5000	.5625	.6250
3	2R5	3	4	5	6	7	8	9	10
4	2R5	3	4	5	6	7	8	9	10
5	– – –	3	4	5	6	7	8	9	10
6	– – –	– – –	4	5	6	7	8	9	10
61	– – –	– – –	4	5	6	7	8	9	10
7	– – –	– – –	4	5	6	7	8	9	10
8	– – –	– – –	– – –	5	6	7	8	9	10
81	– – –	– – –	– – –	5	6	7	8	9	10
9	– – –	– – –	– – –	– – –	6	7	8	9	10
10	– – –	– – –	– – –	– – –	– – –	7	8	9	10

TABLE IV DASH NUMBERS FOR STANDARD RIVET LENGTHS (CONTINUED) 8

BOEING STANDARD NUMBER BACR15GF 4	NOMINAL RIVET LENGTH								
	.7500	.8750	1.0000	1.1250	1.2500	1.3750	1.5000	1.7500	2.0000
3	12	– – –	– –	– – –	– – –	– – –	– – –	– – –	– – –
4	12	14	16	– – –	– – –	– – –	– – –	– – –	– – –
5	12	14	16	18	20	22	24	– – –	– – –
6	12	14	16	18	20	22	24	28	– – –
61	12	14	16	18	20	22	24	28	– – –
7	12	14	16	18	20	22	24	28	– – –
8	12	14	16	18	20	22	24	28	32
81	12	14	16	18	20	22	24	28	32
9	12	14	16	18	20	22	24	28	32
10	12	14	16	18	20	22	24	28	32

PROCUREMENT SPECIFICATION

BPS–R–131, EXCEPT AS NOTED HEREIN.

DRIVEABILITY	–	TEST TO THE PROCEDURES AND REQUIREMENTS OF BPS–R–131, EXCEPT THE DRIVEN HEAD SHALL BE 1.7D FOR LOT ACCEPTANCE TESTING AND 1.8D FOR QUALIFICATION TESTING.
SHEAR STRENGTH	–	TEST PER BPS–R–131 EXCEPT MINIMUM SHEAR STRENGTH SHALL BE 36 KSI; REQUIREMENTS FOR SPECIFIC PARTS ARE LISTED IN TABLE I, TABLE II AND TABLE III, AS APPLICABLE.

PROCESS CAPABILITY REQUIREMENTS

PER BPS–P–170

KEY CHARACTERISTICS – HEAD GAGE PROTRUSION H.

TOLERANCE ZONE LAYOUT OF RIVET HEAD (SEE FIGURE 1)

HORIZONTAL LINE AB REPRESENTING THE TOP OF THE RIVET HEAD, AND VERTICAL LINE CD REPRESENTING THE RIVET AXIS. TWO PARALLEL LINES INCLINED 50 DEGREES TO LINE CD AND INTERSECTING LINE AB AT Amin AND Amax. TWO LINES PARALLEL TO CD AND INTERSECTING LINE AB AT A′min AND A′max. TWO LINES, Dmin AND Dmax, PARALLEL TO LINE CD AND INTERSECTING CONICAL LINES AT Blmc AND Bmmc, RESPECTIVELY. ONE CURVED LINE OF RADIUS .010 TANGENT TO CONICAL LINE THRU Amax AND VERTICAL LINE Dmax. TWO LINES PARALLEL TO AND BELOW LINE AB AT Mlmc AND Mmmc. TWO RADII CENTERED ON LINE CD INTERSECTING LINE CD AND AB, ONE AT Cmin AND Fmin AND ONE AT Cmax AND Fmax, RESPECTIVELY. TOLERANCE ZONE IS SYMMETRICAL ABOUT THE LINE CD.

NOTE:

a. THE TOLERANCE ZONE LAYOUT DETAILED HEREIN IS INTENDED FOR REFERENCE PURPOSES.

b. THE LOCATION OF THE COMPLETE RIVET HEAD WITH RESPECT TO THE SHANK SHALL BE WITHIN THE BOUNDARY DEFINED BY LEAST MATERIAL CONDITION (LMC) AND MAXIMUM MATERIAL CONDITION (MMC), AS SHOWN.

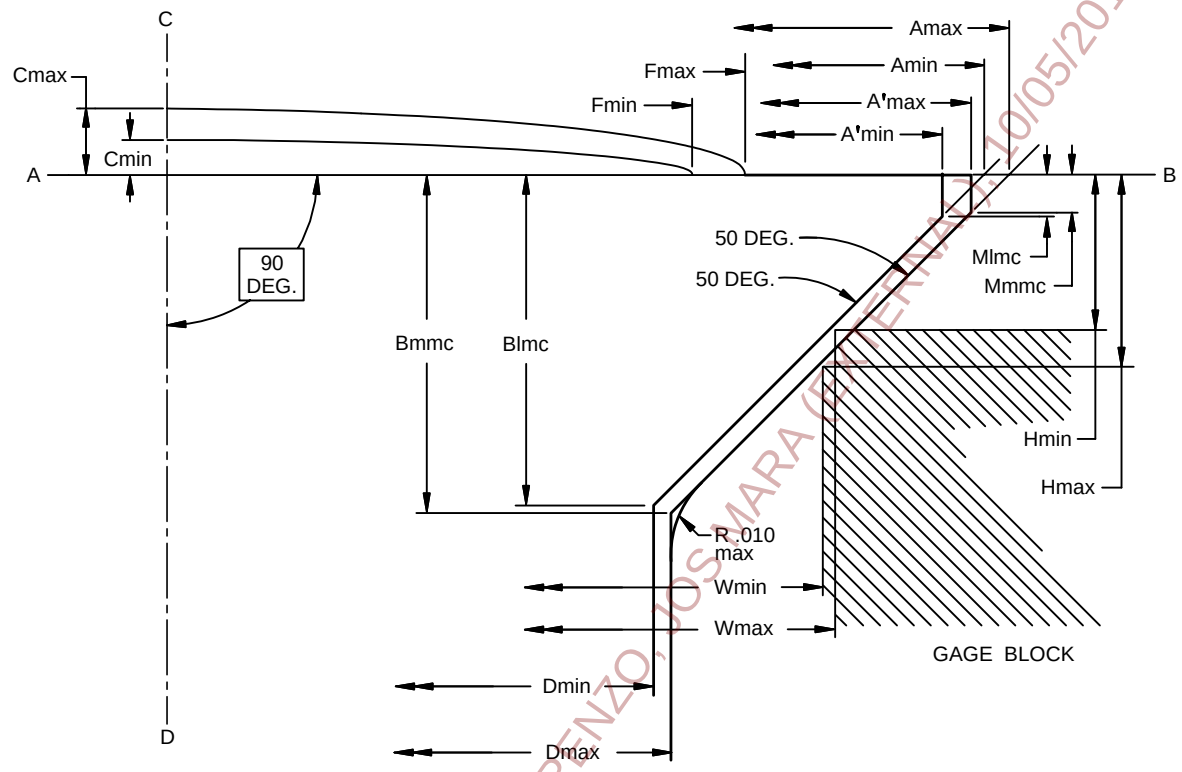


FIGURE 1 PROFILE OF RIVET HEAD (NOT TO SCALE)

MATERIAL

ALUMINUM ALLOY, 2017–T4 PER QQ–A–430 EXCEPT 2017–H15 ROD OR WIRE SHALL BE USED FOR RAW MATERIAL FOR 2017–T4 RIVETS.

HEAT TREATMENT

PER BPS–R–131.

FINISH

SOL GEL CONVERSION COAT PER BAC5663, TYPE III, CLASS 2, APPLIED OVER CHEMICAL CONVERSION COAT PER MIL–C–5541, CLASS 1A, CLEAR, COLORLESS. 16

CHEMICAL CONVERSION COAT PER MIL–C–5541, CLASS 1A, CLEAR, COLORLESS.

RIVETS SHALL BE CAPABLE OF PASSING SALT SPRAY TESTS PER NASM1312–1; TEST DURATION 48 HOURS MINIMUM. AT THE CONCLUSION OF THE SALT SPRAY TEST, THERE SHALL BE NO VISIBLE CORROSION WHEN EXAMINED AT 10X.

LOT SAMPLING SHALL BE IN ACCORDANCE WITH ANSI/ASQC Z1.4, INSPECTION LEVEL S–3, AQL EQUIVALENT OF 6.5 PERCENT DEFECTIVE. LOT SIZE SHALL BE DEFINED IN TERMS OF POUNDS AND SAMPLING SHALL BE DEFINED IN TERMS OF NUMBERS OF RIVETS.

PACKAGING

UNLESS OTHERWISE SPECIFIED ON THE PURCHASE ORDER, PACKING REQUIREMENTS ARE AS FOLLOWS:

RIVETS OF THE SAME LOT, STYLE, SIZE AND PART NUMBER SHALL BE PACKED IN 1 POUND SEALED PLASTIC BAGS. THE 1 POUND PLASTIC BAGS SHALL BE SHIPPED IN INTERMEDIATE CONTAINERS (RIVET BOX) OF 10 POUNDS MAXIMUM.

THE FOLLOWING INFORMATION SHALL BE MARKED ON THE OUTSIDE OF EACH 1 POUND SEALED PLASTIC BAG AND ON EACH INTERMEDIATE CONTAINER (RIVET BOX):

a. AVERAGE HEAD GAGE PROTRUSION, Havg, SHOWN, FOR EXAMPLE, AS: Havg =.0214.

b. STANDARD DEVIATION OF HEAD GAGE PROTRUSION, “S”, SHOWN, FOR EXAMPLE, AS: S = .00012

c. MANUFACTURER LOT NUMBER.

d. MANUFACTURE OR HEAT TREAT DATE.

e. BOEING PART NUMBER.

f. MANUFACTURER’S NAME.

g. BAR CODE WHEN AND AS SPECIFIED ON PURCHASE ORDER.

PROCUREMENT

AEROSPACE RIVET MANUFACTURERS CORP (CAGE CODE 64728) 17

ALLFAST FASTENING SYSTEMS INC (CAGE CODE 53551)

THE MANUFACTURERS LISTED IN BPS–R–131SUP AND THEIR AUTHORIZED DISTRIBUTORS ARE THE ONLY APPROVED SOURCES FOR THE ABOVE QUALIFIED PRODUCTS. SEE BPS–R–131SUP FOR PLANT ADDRESSES. NO CHANGES IN PRODUCT DESIGN, BASIC METHODS OF MANUFACTURE, PLANT SITE OR QUALITY LEVEL SHALL BE MADE WITHOUT PRIOR NOTIFICATION AND PRIOR APPROVAL IN WRITING FROM THE BOEING COMPANY. MANUFACTURERS OF COMPETITIVE PRODUCTS MAY APPLY TO A SUPPLIER MANAGEMENT AND PROCUREMENT DEPARTMENT OF THE BOEING COMPANY FOR QUALIFICATION. IF A MANUFACTURER IS SHOWN ON THIS STANDARD, BUT NOT LISTED IN THE SUPPLEMENT, CONTACT THE DIVISIONAL ENGINEERING STANDARDS FOCAL POINT OR ENGINEERING STANDARDS FOR VERIFICATION.

USAGE AND APPLICATION INFORMATION

INSTALL PER BAC5004–1, BAC5058, OR BAC5063, AS APPLICABLE.

CODING

FIRST DASH NUMBER DESIGNATES NOMINAL SIZE IN .03125 INCREMENTS (SIZES 3 THRU10). FOR SIZES 61 AND 81 (.0156 OVERSIZE) SEE 13.

CODE “D” FOLLOWING FIRST DASH NUMBER DESIGNATES 2017–T4 MATERIAL.

SECOND DASH NUMBER DESIGNATES NOMINAL LENGTH IN .0625 INCREMENTS.

CODE “R5” FOLLOWING SECOND DASH NUMBER DESIGNATES INTERMEDIATE LENGTH .03125 LONGER THAN THE BASIC INCREMENT LENGTH (SECOND DASH NUMBER). 8

EXAMPLE OF PART NUMBER

BACR15GF 6 D 4R5 (DRAWING CALLOUT WILL APPEAR AS BACR15GF6D4R5)

- BACR15GF — BASIC NUMBER
- 6 — NOMINAL SIZE: .1875
- 4R5 — LENGTH: .2500 + .03125 = .28125
- D — MATERIAL: 2017–T4

FASTENER CODE

SEE BACD2074 FOR FASTENER CODES.

SEE D–590–PREFACE (INDEX) FOR INACTIVATION DEFINITIONS. SEE D–590–SUPERSESSION–LIST FOR SUPERSESSION CLASS DEFINITIONS AND SUPERSESSION LIST.