AIRBUS

RIVET - CYLINDRICAL HEAD, LOCKBOLT

Issue : **H**
Date : **Sep 12**
Page : **1/9**

SUMMARY

1 - SCOPE AND FIELD OF APPLICATION

This standard specifies the dimensions, tolerances, required characteristics and the masses of a cylindrical head rivet, lockbolt.

2 - REFERENCES

AMS4967	: Titanium alloy bars, wire forgings and rings 6.0AL-4.0V annealed heat treated.
ANSI-B46-1	: Surface texture (surface roughness waviness and lay).
ASNA2045	: Bush - For use with ASNA2041 and ASNA2042.
EN2424	: Aerospace series - Marking of aerospace products.
EN6117	: Aerospace series - Specification for lubrication of pins with Cetyl Alcohol.
C2022	: Procurement specification.
ISO8080	: Aerospace anodic treatment of titanium and titanium alloys-sulfuric acid process.

3 - TERMINOLOGY

Not applicable.

4 - REQUIRED CHARACTERISTICS

4.1 - Configuration, dimensions, tolerances, mass

4.1.1 - Configuration shall be in accordance with the figure.

4.1.2 - Dimensions shall be in accordance with the figure and tables 1 and 2.

Definition of the grip length code No. : divide grip length by 1,58.

4.1.3 - General tolerances shall be in accordance with the figure and tables 1 and 2.

Concentricity tolerances of the tapered surface of head with respect to Ø A : 5% of Ø A (TIR).

Shank rectitude within the values of S (TIR per shank length of 25,4 mm).

4.1.4 - Mass shall be in accordance with table 3.

4.2 - Materials, finishes, lubrications

Materials, finishes and lubrications shall be in accordance with table 4.

4.3 - Mechanical characteristics

Mechanical characteristics shall be in accordance with table 5.

4.4 - General characteristics

Surface roughness as per ANSI/ASME-B46-1: Ra 0,8 µm for bearing side, shank and coupling radius at both shank ends, Ra 3,2 µm for other surfaces.

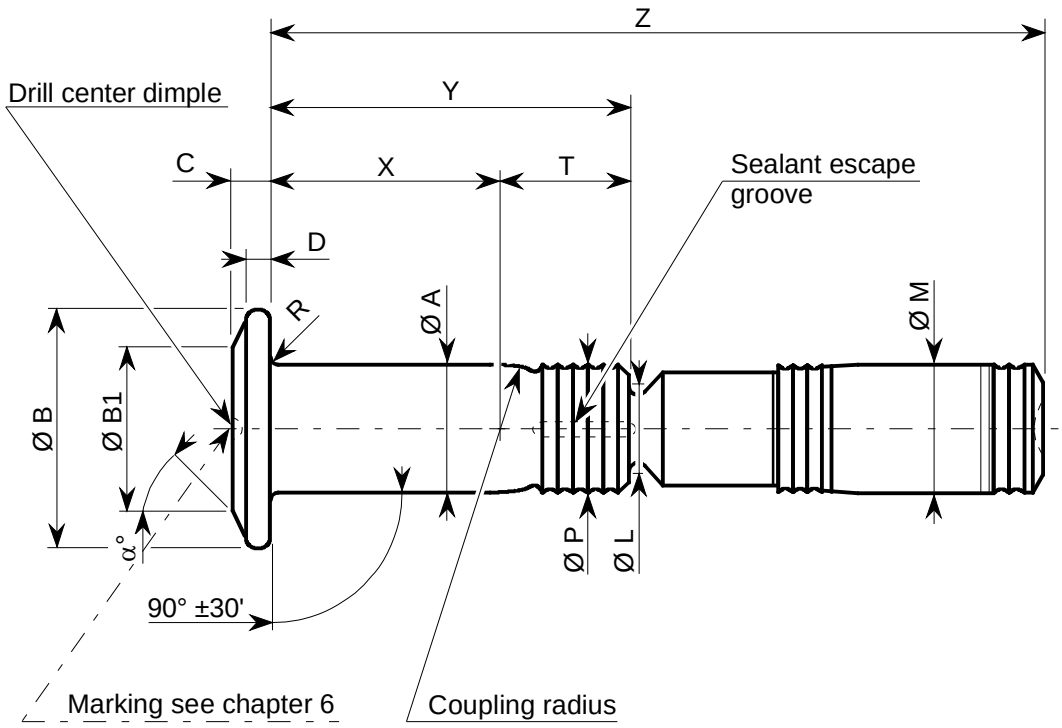


Figure – Configuration, dimensions, tolerances

Table 1 - Dimensions, tolerances

DIA. CODE No.	NOM. Ø	Ø A $^{+\ 0,0127}_{0}$	Ø B ±0,254	Ø B1 ±0,254	C Max. Min.	D Ref.	α° ±4	Ø L Ref.	Ø M Max.	Ø P Max.	R ±0,127	S	T Ref.
2	4,165	4,140	8,484	5,436	1,219 0,965	0,597	72	3,200	3,962	3,962	0,508	0,114	4,445
3	4,826	4,800	9,576	6,147	1,575 1,194	0,759	70	3,810	4,673	4,673			4,470
3A	5,555	5,530	10.846	6.934	1.753 1.372	0.889	69	4.394	5.410	5.410			6.197
4	6,350	6,325	12,116	7,696	1,930 1,549	0,892	69	4,749	6,197	6,197			6,197
5	7,925	7,912	15,215	9,677	2,184 1,803	1,041	71	6,197	7,772	7,772	0,635		7,950
6	9,525	9,500	18,161	11,481	2,565 2,184	1,290	72	7,569	9,398	9,398		0,152	9,499
7	11,112	11,087	19,761	12,700	3,124 2,743	1,577	69	7,925	10,947	10,947			11,100
8	12,700	12,675	21,488	14,275	3,556 3,175	1,824	67	9,525	12,243	12,243			12,776

Dimensions in mm.

Table 2 - Dimensions, tolerances

(diameter code Nos continued on page 5)

GRIP LENGTH CODE No.	PERMISSIBLE GRIP OVERLAP		GRIP LENGTH		X*	DIAMETER CODE No.									
						2		3		3A		4		5	
						Y	Z	Y	Z	Y	Z	Y	Z	Y	Z
	Min.	Max.	Min.	Max.	±0,127	±0,25	+ 1,524 0	±0,25	+ 1,524 0	±0,25	+ 1,524 0	±0,25	+ 1,524 0	±0,25	+ 1,524 0
02	1,19	3,58	1,60	3,18	3,18	7,62	21,01	7,64	22,83	9,37	24,61	9,37	25,96	-	-
03	2,76	5,15	3,20	4,78	4,78	9,22	22,61	9,24	24,43	10,97	26,21	10,97	27,56	12,72	30,45
04	4,36	6,75	4,80	6,35	6,35	10,79	24,18	10,82	26,01	12,55	27,79	12,54	29,13	14,30	32,03
05	5,94	8,33	6,38	7,93	7,93	12,37	25,76	12,39	27,58	14,12	29,36	14,12	30,71	15,87	33,60
06	7,54	9,93	7,95	9,53	9,53	13,97	27,36	13,99	29,18	15,72	30,96	15,72	32,31	17,47	35,20
07	9,11	11,50	9,55	11,13	11,13	15,57	28,96	15,59	30,78	17,32	32,56	17,32	33,91	19,07	36,80
08	10,71	13,10	11,15	12,70	12,70	17,14	30,53	17,17	32,36	18,90	34,14	18,89	35,48	20,65	38,38
09	12,29	14,68	12,73	14,28	14,28	18,72	32,11	18,74	33,93	20,47	35,71	20,47	37,06	22,22	39,95
10	13,89	16,28	14,30	15,88	15,88	20,32	33,71	20,34	35,53	22,07	37,31	22,07	38,66	23,82	41,55
11	15,46	17,85	15,90	17,48	17,48	21,92	35,31	21,94	37,13	23,67	38,91	23,67	40,26	25,42	43,15
12	17,06	19,45	17,50	19,05	19,05	23,49	36,88	23,52	38,71	25,25	40,49	25,24	41,83	27,00	44,73
13	18,64	21,03	19,08	20,63	20,63	25,07	38,46	25,09	40,28	26,82	42,06	26,82	43,41	28,57	46,30
14	20,24	22,63	20,65	22,23	22,23	26,67	40,06	26,69	41,88	28,42	43,66	28,42	45,01	30,17	47,90
15	21,81	24,20	22,25	23,83	23,83	28,27	41,66	28,29	43,48	30,02	45,26	30,02	46,61	31,77	49,50
16	23,41	25,80	23,85	25,40	25,40	29,84	43,23	29,87	45,06	31,60	46,84	31,59	48,18	33,35	51,08
17	24,99	27,38	25,43	26,98	26,98	31,42	44,81	31,44	46,63	33,17	48,41	33,17	49,76	34,92	52,65
18	26,59	28,98	27,00	28,58	28,58	33,02	46,41	33,04	48,23	34,77	50,01	34,77	51,36	36,52	54,25
19	28,16	30,55	28,60	30,18	30,18	34,62	48,01	34,64	49,83	36,37	51,61	36,37	52,96	38,12	55,85
20	29,76	32,15	30,20	31,75	31,75	36,19	49,58	36,22	51,41	37,95	53,19	37,94	54,53	39,70	57,43
21	31,34	33,73	31,78	33,33	33,33	37,77	51,16	37,79	53,04	39,52	54,76	39,52	56,11	41,27	59,00
22	32,94	35,33	33,35	34,93	34,93	39,37	52,76	39,39	54,58	41,12	56,36	41,12	57,71	42,87	60,60
23	34,51	36,90	34,95	36,53	36,53	40,97	54,36	40,99	56,18	42,72	57,96	42,72	59,31	44,47	62,20
24	36,11	38,50	36,55	38,10	38,10	42,54	55,93	42,57	57,76	44,30	59,54	44,29	60,88	46,05	63,78
25	37,69	40,08	38,13	39,68	39,68	44,12	57,51	44,14	59,33	45,87	61,11	45,87	62,46	47,62	65,35
26	39,29	41,68	39,70	41,28	41,28	45,72	59,11	45,74	60,93	47,47	62,71	47,47	64,06	49,22	66,95
27	40,86	43,25	41,30	42,88	42,88	47,32	60,71	47,35	62,53	49,07	64,31	49,07	65,66	50,82	68,55
28	42,46	44,85	42,90	44,45	44,45	48,89	62,28	48,92	64,11	50,65	65,89	50,64	67,23	52,40	70,13
29	44,04	46,43	44,48	46,03	46,03	50,47	63,86	50,49	65,68	52,22	67,46	52,22	68,81	53,97	71,70
30	45,64	48,03	46,05	47,63	47,63	52,07	65,46	52,09	67,28	53,82	69,06	53,82	70,41	55,57	73,30
31	47,21	49,60	47,65	49,23	49,23	53,67	67,06	53,69	68,88	55,42	70,66	55,42	72,01	57,17	74,90
32	48,81	51,20	49,25	50,80	50,80	55,24	68,63	55,27	70,46	57,00	72,24	56,99	73,58	58,75	76,48

***** Grip length is measured from the underside of the head to the end of the full cylindrical portion of the shank.

Dimensions in mm.

Table 2 - (diameter code Nos continued from page 4) (end)

GRIP LENGTH CODE No.	PERMISSIBLE GRIP OVERLAP		GRIP LENGTH		X*	DIAMETER CODE No.					
						6		7		8	
						Y	Z	Y	Z	Y	Z
	Min.	Max.	Min.	Max.	±0,127	±0,25	+ 1,524 0	±0,25	+ 1,524 0	±0,25	+ 1,524 0
02	1,19	3,58	1,60	3,18	3,18	-	-	-	-	-	-
03	2,76	5,15	3,20	4,78	4,78	-	-	-	-	-	-
04	4,36	6,75	4,80	6,35	6,35	15,85	35,33	17,45	39,60	19,13	43,56
05	5,94	8,33	6,38	7,93	7,93	17,42	36,91	19,02	41,17	20,70	45,14
06	7,54	9,93	7,95	9,53	9,53	19,02	38,51	20,62	42,77	22,30	46,74
07	9,11	11,50	9,55	11,13	11,13	20,62	40,11	22,23	44,37	23,90	48,34
08	10,71	13,10	11,15	12,70	12,70	22,20	41,68	23,80	45,95	25,48	49,91
09	12,29	14,68	12,73	14,28	14,28	23,77	43,26	25,37	47,52	27,05	51,49
10	13,89	16,28	14,30	15,88	15,88	25,37	44,86	26,97	49,12	28,65	53,09
11	15,46	17,85	15,90	17,48	17,48	26,97	46,46	28,58	50,72	30,25	54,69
12	17,06	19,45	17,50	19,05	19,05	28,55	48,03	30,15	52,30	31,83	56,26
13	18,64	21,03	19,08	20,63	20,63	30,12	49,61	31,72	53,87	33,40	57,84
14	20,24	22,63	20,65	22,23	22,23	31,72	51,21	33,32	55,47	35,00	59,44
15	21,81	24,20	22,25	23,83	23,83	33,32	52,81	34,93	57,07	36,60	61,04
16	23,41	25,80	23,85	25,40	25,40	34,90	54,38	36,50	58,65	38,18	62,61
17	24,99	27,38	25,43	26,98	26,98	36,47	55,96	38,05	60,22	39,75	64,19
18	26,59	28,98	27,00	28,58	28,58	38,07	57,56	39,67	61,82	41,35	65,79
19	28,16	30,55	28,60	30,18	30,18	39,67	59,16	41,28	63,42	42,95	67,39
20	29,76	32,15	30,20	31,75	31,75	41,25	60,73	42,85	65,00	44,53	68,96
21	31,34	33,73	31,78	33,33	33,33	42,82	62,31	44,42	66,57	46,10	70,54
22	32,94	35,33	33,35	34,93	34,93	44,42	63,91	46,02	68,17	47,70	72,14
23	34,51	36,90	34,95	36,53	36,53	46,02	65,51	47,63	69,77	49,30	73,74
24	36,11	38,50	36,55	38,10	38,10	47,60	67,08	49,20	71,35	50,88	75,31
25	37,69	40,08	38,13	39,68	39,68	49,17	68,66	50,75	72,92	52,45	76,89
26	39,29	41,68	39,70	41,28	41,28	50,77	70,26	52,37	74,52	54,05	78,49
27	40,86	43,25	41,30	42,88	42,88	52,37	71,86	53,98	76,12	55,65	80,09
28	42,46	44,85	42,90	44,45	44,45	53,95	73,43	55,55	77,70	57,23	81,66
29	44,04	46,43	44,48	46,03	46,03	55,52	75,01	57,12	79,27	58,80	83,24
30	45,64	48,03	46,05	47,63	47,63	57,12	76,61	58,72	80,87	60,40	84,84
31	47,21	49,60	47,65	49,23	49,23	58,72	78,21	60,33	82,47	62,00	86,44
32	48,81	51,20	49,25	50,80	50,80	60,30	79,78	61,90	84,05	63,58	88,01

***** Grip length is measured from the underside of the head to the end of the full cylindrical portion of the shank.

Dimensions in mm.

Table 3 - Mass

GRIP LENGTH CODE No.		MASS (g)						
		DIAMETER CODE No.						
	2	3	3A	4	5	6	7	8
02	0,66	0,97	1,473	1,96	3,69	5,84	-	-
03	0,75	1,09	1,642	2,18	4,03	6,34	-	-
04	0,85	1,22	1,810	2,40	4,38	6,84	8,78	-
05	0,94	1,35	1,979	2,62	4,73	7,34	9,51	13,51
06	1,04	1,48	2,148	2,85	5,07	7,84	10,25	14,47
07	1,13	1,60	2,317	3,07	5,42	8,34	10,99	15,43
08	1,23	1,73	2,486	3,29	5,76	8,84	11,71	16,38
09	1,32	1,86	2,655	3,51	6,11	9,33	12,44	17,33
10	1,42	1,99	2,824	3,73	6,45	9,83	13,18	18,30
11	1,51	2,11	2,993	3,95	6,80	10,33	13,91	19,26
12	1,61	2,24	3,162	4,17	7,14	10,83	14,64	20,21
13	1,70	2,37	3,330	4,39	7,49	11,33	15,37	21,21
14	1,80	2,49	3,499	4,61	7,84	11,83	16,11	22,12
15	1,89	2,62	3,668	4,83	8,18	12,33	16,84	23,09
16	1,99	2,75	3,837	5,05	8,53	12,83	17,57	24,04
17	2,08	2,88	4,006	5,28	8,87	13,32	18,29	24,99
18	2,18	3,01	4,175	5,50	9,22	13,82	19,04	25,95
19	2,27	3,13	4,344	5,72	9,56	14,32	19,77	26,92
20	2,37	3,26	4,513	5,94	9,91	14,82	20,50	27,87
21	2,46	3,39	4,681	6,16	10,25	15,32	21,23	28,81
22	2,56	3,51	4,850	6,38	10,60	15,82	21,97	29,78
23	2,65	3,64	5,019	6,60	10,95	16,31	22,70	30,74
24	2,74	3,77	5,188	6,82	11,29	16,81	23,43	31,69
25	2,84	3,90	5,357	7,04	11,64	17,31	24,14	32,64
26	2,93	4,02	5,526	7,26	11,98	17,81	24,89	33,61
27	3,03	4,15	5,695	7,48	12,33	18,31	25,63	34,57
28	3,12	4,28	5,864	7,70	12,67	18,81	26,36	35,52
29	3,22	4,41	6,033	7,93	13,02	19,30	27,09	36,47
30	3,31	4,53	6,201	8,15	13,37	19,80	27,82	37,43
31	3,41	4,66	6,370	8,37	13,71	20,30	28,56	38,40
32	3,50	4,79	6,539	8,59	14,06	20,80	29,29	39,35

Table 4 - Materials, finishes, lubrications

MATERIAL	FINISH	LUBRICATION
Titanium alloy 6AL-4V as per AMS4967 Rc = 655 MPa min.	Sulfuric-acid-anodizing as per ISO8080	Cetyl alcohol as per EN6117

Table 5 - Mechanical characteristics

DIAMETER CODE No.	NOMINAL Ø	DOUBLE SHEAR STRENGTH Min. (daN)	TENSILE STRENGTH WITH BUSH ASNA2045 Min. (daN)
2	4,165	1 780	666
3	4,826	2 388	843
3A	5,550	3195	999
4	6,350	4 120	1 531
5	7,925	6 482	2 668
6	9,525	9 324	3 558
7	11,112	12 721	4 537
8	12,700	16 591	5 560

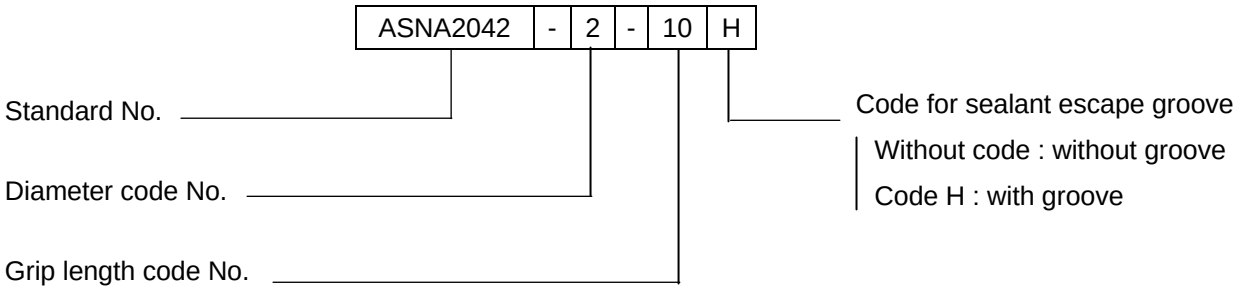
Dimensions in mm.

5 - DESIGNATION

Example of part number identification to be used on drawing schedules :

ASNA2042-2-10H , Rivet

Example of part number construction :



When calling up the diameter 3A fastener there is no requirement for the '-' between the A of the diameter code and the grip length e.g ASNA2042-3A10H

6 - MARKING

Parts shall be marked as per EN2424, category G.
Manufacturer's reference marking on head (recessed of 0,254 mm max.).

7 - TECHNICAL SPECIFICATION

As per manufacturer's specification C2022.

8 - MANUFACTURERS

Refer to the list of qualified manufacturers and products.

AMENDMENT RECORD SHEET

Issue	Modified paragraph	Modification summary	Justification
A.05.84		New standard.	
B.03.85			
C.04.85		Amended standard.	
D.06.96		Standard fully amended. Optional groove added. Technical specification modified : I.C.T. 65 changed to C2022.	Following letter Daimler-Benz Aerospace Airbus Ref. EIA - WG1-F30/96
E.04.99		Diameter code Nos 7 (11,112 mm) and 8 (12,700 mm) added.	TF3 decision Harmonization of A3XX attachments
F.05.07		"Grip length" is called "X". In table 1, values of dimensions "Ø A", "Ø B" and "R" modified. Dimension B1 added. In figure, drill center and angle 90° ±30' added. EN6118 changed to EN6117 in chapter 2 and table 4. Position of α modified in figure. Dimensions "Ø M" for dia. code No. 6 modified in table 1. "Admissible tightening torque" changed to "Permissible grip overlap" in table 2. ISO8080 added for finish in chapter 2 and table 4.	In accordance with manufacturer documentation
G.03.08		Tolerance of Ø A modified in table 1: ± 0,0127 mm changed to $^{+\ 0,0127}_{0}$ mm. Grip length 02 added for diameter code 4.	
H 09.12	Tables, 1, 2, 3 and 5	Addition of diameter 3A.	Requested for new designs.

NOTE : Modification to the last standard issue are indicated by a vertical line in the margin.