Aerospace series
Bolt, Blind, 100º Flush Tension Head
Self-Locking

"When this standard is applied, a careful check must be made as to whether any protective rights exist. This standard issuer hereby disclaims any liability for infringement of patent or design rights resulting from the use of this standard'

Published and distributed by:
AIRBUS S.A.S.
ENGINEERING DIRECTORATE
31707 BLAGNAC Cedex
FRANCE

Contents

1 Scope

This standard specifies the required characteristics of a Blind, 100º Flush Tension Head, Self-Locking Bolt for use in aerospace applications.

2 Normative references

This Airbus Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this Airbus Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

AMS5731	Steel corrosion and heat resistant bars and forgings
AMS5732	Steel corrosion and heat resistant bars and forgings
AMS5737	Steel corrosion and heat resistant bars and forgings
AMS5639	Steel corrosion resistant bars and forgings
AMS4928	Titanium alloy bars and forgings
AMS4967	Titanium alloy bars and forgings
ASTM D4181	Classification for Acetal molding and extrusions
EN 2424	Aerospace series - Marking of aerospace products
FCBF200	Fasteners, blind, high strength for advanced composite materials
FCBF203	Installation and inspection specification
ISO 2768-1	General tolerances
MBF2000	Procurement specification
MBF2001	Installation and inspection specification
MIL-H-81200	Heat treatment of Titanium and Titanium alloys
MIL-L-46010	Lubricant solid film heat cured
MIL-T-9047	Titanium and Titanium Alloy bars
AMS2700	Passivation of corrosion resistant steels

3 Requirements

3.1 Configuration, dimensions, tolerances and mass

3.1.1 The configuration, dimensions, tolerances and mass shall conform with figures 1 & 2 and tables 2 & 3. Tolerances not specified, shall be in accordance with ISO2768-1.

3.1.2 Locking feature consists of three indentations located approximately 120° apart on the periphery of the nut component. Distortion of the shank shall not prevent insertion of the fastener into a ring gauge of diameter equivalent to minimum recommended hole size. Force of insertion shall not exceed 5.0 pounds.

3.1.3 Holes should be straight and perpendicular to surface, and should be reasonably round and free from delaminations.

3.1.4 Sheets should be firmly clamped together during drilling.

3.1.5 Edge of holes should be given a slight chamfer.

3.1.6 Core bolt break-off limits is measured from top of nut head.

3.1.7 Installation and inspection specification to MBF2001 or FCBF203 (depending on which be the supplier).

3.1.8 Mechanical properties shall be in accordance with table 4.

3.2 Material and surface treatment

Table 1: Material and surface treatment

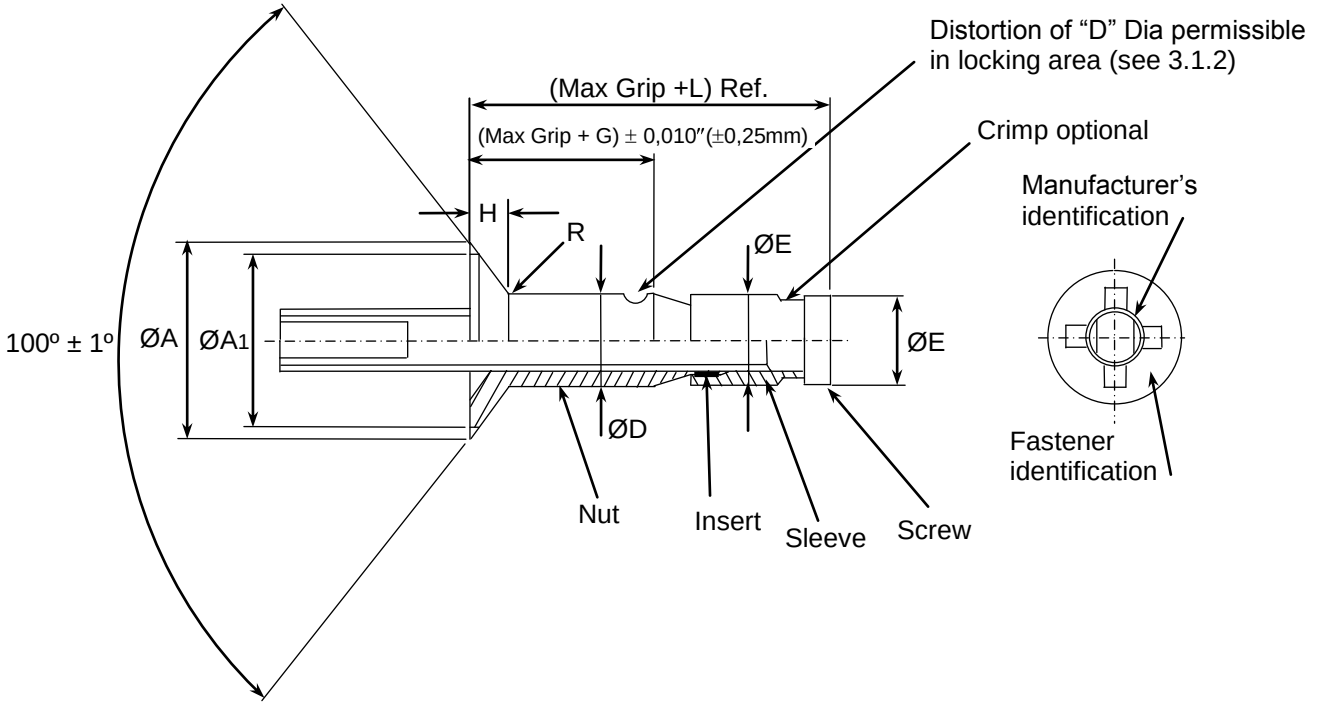
Item	Material	Heat Treatment	Surface treatment	Code
Nut	6Al–4V Titanium per MIL–T–9047 STA or AMS4928 or AMS4967	MIL–H–81200 Maximum Hydrogen 125PPM	Phosphate Fluoride	None
Screw	A–286 (UNSS66286) with chemical composition per AMS5731, AMS5732 or AMS5737	As Required for performance	Passivate per AMS2700. Method 1, type 6,7 or 8 or Method 2.	
Sleeve	304 Stainless steel per AMS5639			
Insert	ACETAL per ASTM D4181	–	None	
* Drive Nut	Mild steel		Light grey corrosion protective coating	

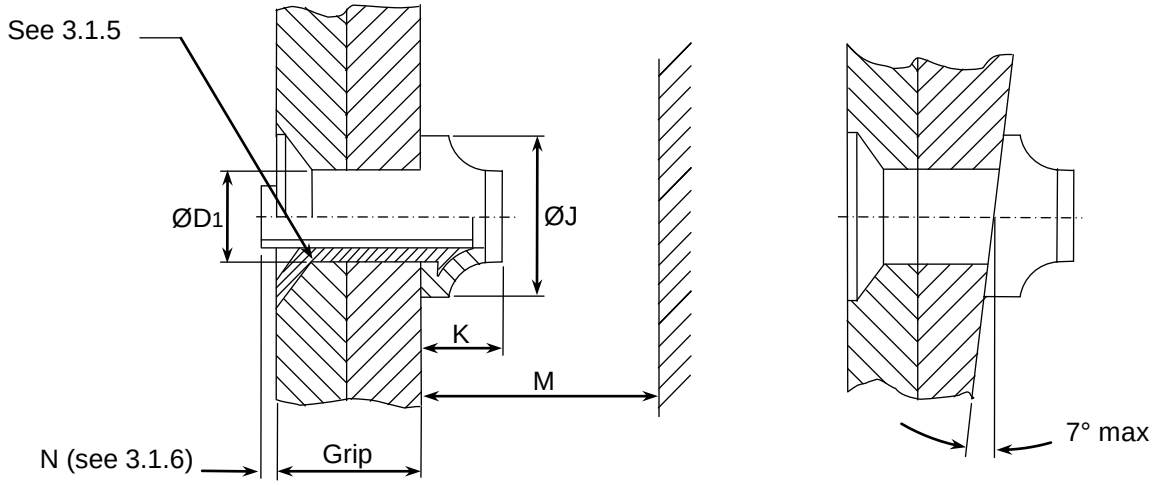
* Procurement code (Z) only.

Note: Following lubricants may be applied to each one of the components by the fastener manufacturer, as required for performance (no other being allowed).

Nut: Cetyl Alcohol per MIL-L-87132.

Screw and Sleeve: Dry film lube per MIL-L-46010 (Type I or Type III), Everlube 812, or Cetyl Alcohol per MIL-L-87132.



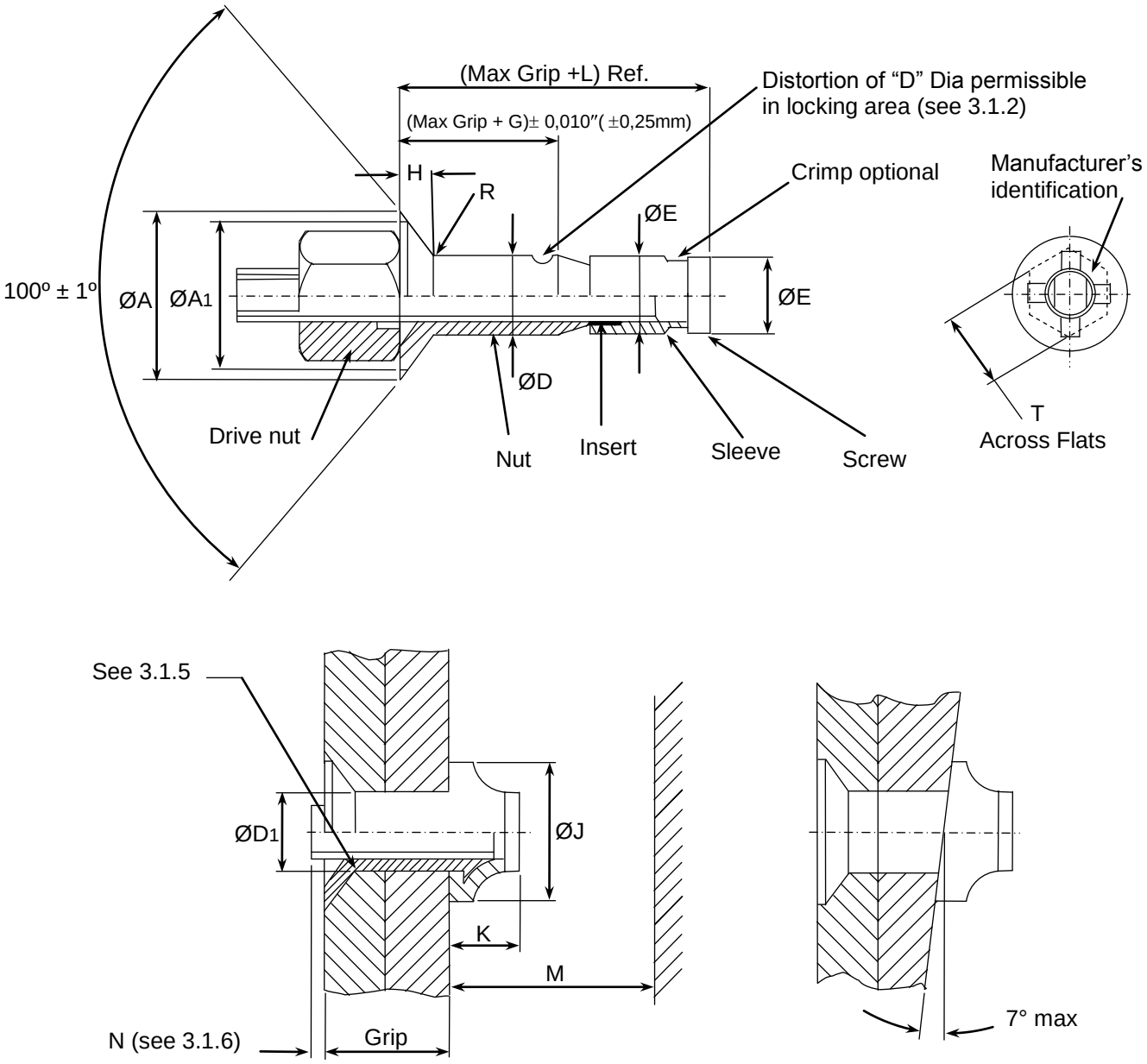


Typical installation
(see notes 3.1.3 and 3.1.4)

To be used on surfaces
with slope up to 7º max

Procurement code (Y)

Figure 1: Configuration



Typical installation
(see notes 3.1.3 and 3.1.4)

To be used on surfaces
with slope up to 7º max

Procurement code (Z)

Figure 2: Configuration

Table 2: Dimensions and Tolerances (continued)

Dimensions in inch (mm)

Diameter Dash Number	Nominal Ø	ØA Theoretical Not for insp. purposes	ØA1 Min	ØD	ØE Max	G Ref	H Ref	L Ref	R Rad max	T Ref
–5	5/32 (4,0)	0.332 0.325 (8,43) (8,26)	0.296 (7,52)	0.1645 0.1625 (4,178) (4,128)	0.1640 (4,165)	0.017 (0,43)	0.070 (1,78)	0.512 (13,00)	0.030 (0,76)	0.375 (9,52)
–6	3/16 (4,8)	0.385 0.378 (9,78) (9,60)	0.342 (8,69)	0.1985 0.1965 (5,041) (4,992)	0.1985 (5,041)	0.027 (0,69)	0.077 (1,96)	0.575 (14,60)		
–7	7/32 (5,6)	0.416 0.409 (10,56) (10,39)	0.373 (9,47)	0.2275 0.2255 (5,778) (5,728)	0.2275 (5,778)	0.035 (0.89)	0.077 (1,96)	0.635 (16,13)		
–8	1/4 (6,4)	0.507 0.499 (12,88) (12,67)	0.463 (11,76)	0.2595 0.2575 (6,591) (6,541)	0.2595 (6,591)	0.055 (1,40)	0.104 (2,64)	0.700 (17,78)		
–10	5/16 (8,0)	0.635 0.626 (16,13) (15,90)	0,577 (14,66)	0.3115 0.3095 (7,912) (7,861)	0.3110 (7,899)	0.070 (1,78)	0.136 (3,45)	0.892 (22,66)	0.040 (1,02)	0.500 (12,70)
-12 [1)]	3/8 (9,5)	0.762 0.752 (19,35) (19,10)	0,696 (17,68)	0.3745 0.3725 (9,512) (9,462)	0.3740 (9,500)	0.080 (2,03)	0.162 (4,11)	1.090 (27,69)	0.040 (1,02)	0.500 (12,70)

1) Diameter dash number –12 will only be used for repair solutions

Table 2: Dimensions and Tolerances (concluded)

Installation see notes 3.1.3 & 3.1.4						
Diameter Dash Number	**Nominal Ø**	**ØD1 Recm hole size**	**ØJ min**	**K max**	**M Ref**	**N See note 3.1.6**
–5	5/32 (4,0)	0.168 0.165 (4,267) (4,191)	0.250 (6,35)	0.300 (7,62)	0.382 (9,70)	+0.103 –0.000 +(2,62) –(0,00)
–6	3/16 (4,8)	0.202 0.199 (5,131) (5,055)	0.300 (7,62)	0.350 (8,89)	0.435 (11,05)	
–7	7/32 (5,6)	0.231 0.228 (5,867) (5,791)	0.350 (8,89)	0.400 (10,16)	0.485 (12,31)	
–8	1/4 (6,4)	0.263 0.260 (6,680) (6,604)	0.400 (10,16)	0.450 (11,43)	0.550 (13,97)	
–10	5/16 (8,0)	0.315 0.312 (8,00) (7,92)	0.475 (12,06)	0.550 (13,97)	0.662 (16,81)	
–12 [1)]	3/8 (9,5)	0.378 0.375 (9,60) (9,52)	0.575 (14,60)	0.625 (15,88)	0.790 (20,07)	

1) Diameter dash number –12 will only be used for repair solutions

Table 3: Grip sizes and mass

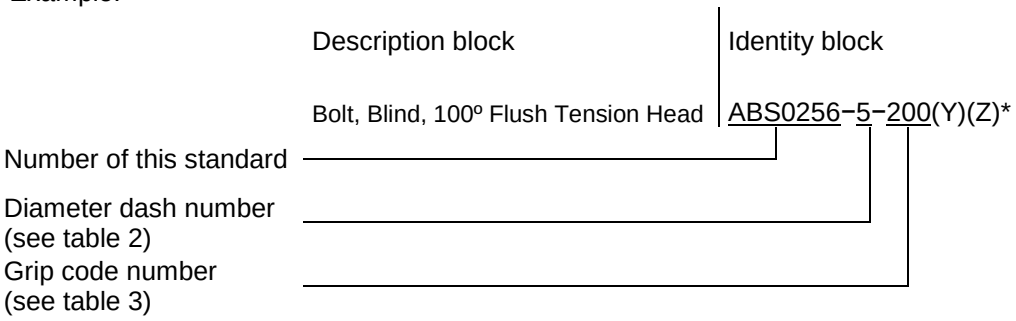
Diameter Dash Number					–5	–6	–7	–8	-10	-12
Nominal Diameter In (mm)					5/32 (4,0)	3/16 (4,8)	7/32 (5,6)	1/4 (6,4)	5/16 (8,0)	3/8 (9,5)
Grip Code No	Grip Range inch		mm		Mass Kg/1000 Parts (Ref)					
	Max	Min	Max	Min						
–150	0.150	0.100	3,81	2,54	1,13	1,91	2,76	3,97	--	--
–200	0.200	0.150	5,08	3,81	1,25	2,06	3,06	4,21	--	--
–250	0.250	0.200	6,35	5,08	1,37	2,20	3,36	4,44	7,29	11,76
–300	0.300	0.250	7,62	6,35	1,48	2,35	3,66	4,68	7,63	12,35
–350	0.350	0.300	8,89	7,62	1,60	2,49	3,96	4,91	7,97	12,94
–400	0.400	0.350	10,16	8,89	1,72	2,64	4,26	5,15	8,31	13,53
–450	0.450	0.400	11,43	10,16	1,83	2,78	4,56	5,38	8,66	14,12
–500	0.500	0.450	12,70	11,43	1,95	2,93	4,86	5,62	9,00	14,71
–550	0.550	0.500	13,97	12,70	2,07	3,07	5,16	5,85	9,34	15,30
–600	0.600	0.550	15,24	13,97	2,18	3,22	5,46	6,08	9,68	15,89
–650	0.650	0.600	16,51	15,24	2,30	3,36	5,76	6,32	10,01	16,48
–700	0.700	0.650	17,78	16,51	2,42	3,50	6,06	6,55	10,35	17,07
–750	0.750	0.700	19,05	17,78	2,54	3,65	6,36	6,79	10,69	17,66
–800	0.800	0.750	20,32	19,05	2,65	3,79	6,66	7,02	11,03	18,26
–850	0.850	0.800	21,59	20,32	2,77	3,94	6,96	7,26	11,37	18,85
–900	0.900	0.850	22,86	21,59	2,88	4,08	7,26	7,49	11,71	19,44
–950	0.950	0.900	24,13	22,86	3,00	4,22	7,56	7,72	12,05	20,03
–1000	1.000	0.950	25,40	24,13	3,12	4,37	7,86	7,96	12,39	20,62
–1050	1.050	1.000	26,67	25,40	3,24	4,51	8,16	8,19	12,73	21,21
–1100	1.100	1.050	27,94	26,67	3,35	4,66	8,46	8,43	13,07	21,80
–1150	1.150	1.100	29,21	27,94	3,47	4,80	8,76	8,66	13,41	22,39
–1200	1.200	1.150	30,48	29,21	3,59	4,95	9,06	8,90	13,75	22,98
–1250	1.250	1.200	31,75	30,48	3,71	5,09	9,36	9,13	14,09	23,57
–1300	1.300	1.250	33,02	31,75	3,82	5,24	9,66	9,37	14,43	24,16
–1350	1.350	1.300	34,29	33,02	3,93	5,39	9,96	9,61	14,77	24,75
–1400	1.400	1.350	35,56	34,29	4,04	5,54	10,26	9,85	15,11	25,34
–1450	1.450	1.400	36,83	35,56	4,15	5,69	10,56	10,09	15,45	25,93
–1500	1.500	1.450	38,10	36,83	4,26	5,84	10,86	10,33	15,79	26,52
–1550	1.550	1.500	39,37	38,10	4,37	5,99	11,16	11,57	16,13	27,11
–1600	1.600	1.550	40,64	39,37	4,48	6,14	11,46	11,81	16,47	27,70
–1650	1.650	1.600	41,91	40,64	4,59	6,29	11,76	11,05	16,81	28,29
–1700	1.700	1.650	43,18	41,91	4,70	6,44	12,06	11,29	17,15	28,88

Table 4: Mechanical Properties

Diameter Dash No	Locking Torque (Min)		Double Shear Strength (Min)		Tensile Strength (Min)	
	In-lb	Nm	lb	daN	lb	daN
–5	1.0	0,11	3150	1401	900	400
–6	1.5	0,17	4600	2046	1400	623
–7	2.0	0,23	5600	2490	1600	712
–8	2.5	0,28	7900	3514	2100	934
–10	3.5	0,40	11350	5049	3600	1601
-12	4.0	0,45	16450	7317	5000	2224

4 Designation

Example:



*Letters “Y” or “Z” are reserved for the sole use of Procurement Departments for ordering purposes.

5 Marking

EN 2424 style A

6 Technical specification

MBF2000 or FCBF200 (depending on supplier).

RECORD OF REVISIONS

Issue	Clause modified	Description of modification
7 06/04	3.1.6, Tables 2 & 3	Measure change of the core bolt break off limit. Addition of diameter –10. Rewritten in new format.
8 11/04	3.2 (note)	Removal of paraffin wax lubricant.
9 06/07	Tables 2 & 4	Addition of diameter –12.
	Table 3	Correction of max grip in mm for grip code (-600)
10 02/11		Correction of min grip in mm for grip code (-650).
	Table 2 & Figures 1, 2	ΦP csk removed (because same dimension as ΦA)