

Aerospace series
Pin, swage locking,
Pull type
Protruding,
Intermediate head

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1 Scope

This standard specifies the dimensions and tolerances of a swage locking pin for use in aerospace applications.

2 Normative references

This Airbus Standard incorporates by dated or undated reference provisions from other publications. All normative references cited at the appropriate places in the text are listed hereafter. For dated references, subsequent amendments to or revisions of any these publications apply to this Airbus Standard only when incorporated in it by amendment or revision. For undated references, the latest issue of the publication referred to shall be applied.

AMS4967	Titanium alloy, bars, wire, forgings and rings 6AL-4V annealed, heat treatable ¹⁾
ANSI B46.1	Surface texture (surface roughness, waviness and lay) ¹⁾
ASNA2025	Collar, Aluminium alloy
EN2424	Marking of aerospace products. ²⁾
HPS C 2010	Technical specification
EN6117	Specification for lubrication of Bolts with cetyl alcohol ²⁾
NAS4006	Aluminium coating
ASNA2392	Rivet, Medium head, cylindrical, lockbolt

¹⁾ Published as AECMA Prestandard at the date of publication of this standard

²⁾ Published by: Society of Automotive Engineers (SAE), 400 Commonwealth Drive, Warrendale, PA 15096-0001, USA

3 Requirements

3.1 Configuration – Dimensions – Tolerances - Mass

3.1.1 Configuration shall be in accordance with the figure.

3.1.2 Material shall be in accordance with table 1.

3.1.3 Dimensions and shall be in accordance with tables 2 and 3 and mass shall be in accordance with table 3.

3.1.4 Mechanical Characteristics shall be in accordance with table 4.

3.1.5 Pins shall be permanently and legibly marked on the head with at least the manufacturer's part number and trademark and the material code, by depressed characters 0.006in (0,15mm) maximum depth.

3.1.6 Refer to HPS C 2010 for Procurement Technical Specification.

3.1.7 Surface texture before coating (Ra max in accordance with ANSI B46.1) : conical surface of head, head to shank fillet radius, shank and transition radius, 32 µin (0,8µm) all other surfaces 125 µin (3,2µm).

3.1.8 Optional to omit Aluminium Coating from the end 0.250in (6,35mm) approx of Pintail.

3.1.9 This portion of the fastener has a variable length and is used for installation only

3.1.10 Shank straightness to be within 0.0045in (0,114mm) T.I.R. per inch (25,4mm) of shank length.

3.1.11 Permissible natural flow of material, shall be free of sharp corner.

3.1.12 Parts above the heavy line are dimensionally identical to the corresponding ASNA2392 part.

3.1.13 Grip lengths shall be measured from the underside of the head to the end of the cylindrical portion off the shank.

3.2 Materials and surface treatment

Table 1 : Materials and surface finish

Material	Material Specification	Surface treatment	Surface treatment specification	Lubrication Specification	Material Code	Finish Code
Titanium Alloy 6AL-4V	AMS4967	Resin based Aluminium	Per NAS4006	Cetyl alcohol per EN6117	V	HK

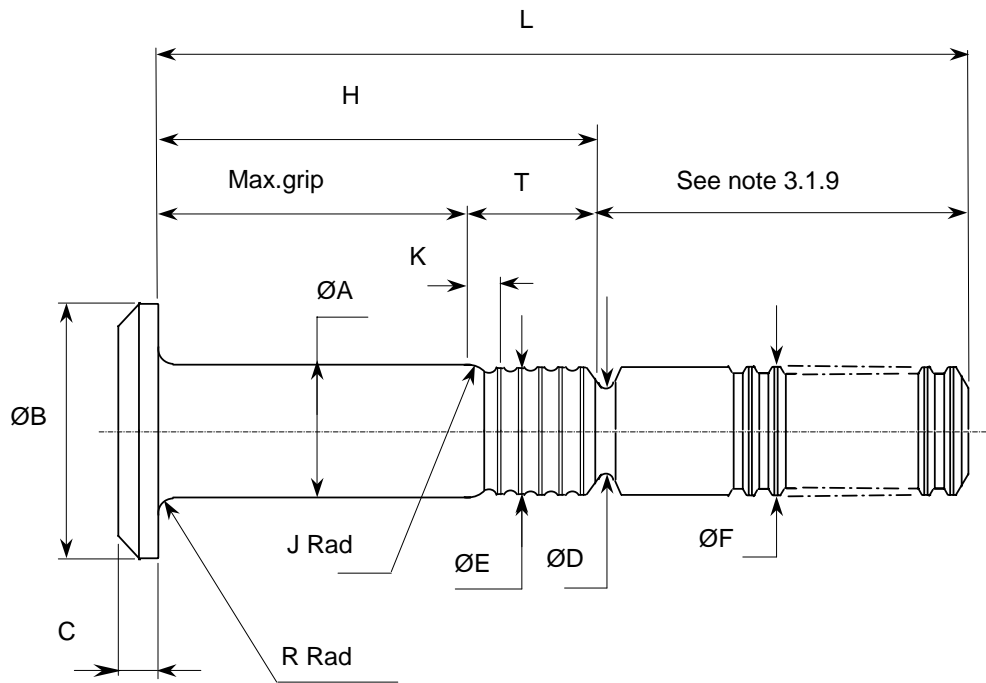


Figure 1 : Configuration

Table 2 : Dimensions

Dimensions in inches (millimetres)

Diameter Dash Number	A		B		C		D (ref)	E (Max)	F (Max)
	(Max)	(Min)	(Max)	(Min)	(Max)	(Min)			
3	0.1895 4,813	0.1885 4,788	0.377 9,58	0.357 9,07	0.067 1,70	0.057 1,45	0.150 3,81	0.184 4,67	0.184 4,67
4	0.2495 6,337	0.2485 6,312	0.435 11,05	0.415 10,54	0.085 2,16	0.075 1,90	0.187 4,75	0.244 6,20	0.244 6,20
5	0.3120 7,925	0.3110 7,899	0.493 12,52	0.473 12,01	0.102 2,59	0.092 2,34	0.244 6,20	0.306 7,77	0.306 7,77
6	0.3745 9,512	0.3735 9,487	0.563 14,30	0.543 13,79	0.117 2,97	0.107 2,72	0.298 7,57	0.370 9,40	0.370 9,40

Table 2 : Dimensions (Concluded)

Dimensions in inches (millimetres)

Diameter Dash Number	J (Min)	K (Ref)	R		T (Ref)
			(Max)	(Min)	
3	0.047 1,19	0.040 1,02	0.025 0,64	0.015 0,38	0.152 3,86
4	0.114 2,90	0.058 1,47			0.210 5,33
5	0.142 3,61	0.069 1,75	0.030 0,76	0.020 0,51	0.269 6,83
6	0.177 4,50	0.088 2,24			0.321 8,15

Table 3 : Grip lengths

Dimensions in inches (millimetres)

Grip Dash No	Grip range		Dia dash No 3				
			H		L		Mass
	(Max)	(Min)	(Max)	(Min)	(Max)	(Min)	
02	0.125 (3,18)	0.063 (1,60)	0.287 7,29	0.267 6,78	0.934 (23,72)	0.874 (22,20)	0.74
03	0.188 (4,78)	0.126 (3,20)	0.350 (8,89)	0.330 (8,38)	0.997 (25,32)	0.937 (23,80)	0.88
04	0.250 (6,35)	0.189 (4,80)	0.412 (10,46)	0.392 (9,96)	1.059 (26,90)	0.999 (25,37)	0.98
05	0.312 (7,92)	0.251 (6,38)	0.474 (12,04)	0.454 (11,53)	1.121 (28,47)	1.061 (26,95)	1.11
06	0.375 (9,52)	0.313 (7,95)	0.537 (13,64)	0.517 (13,13)	1.184 (30,07)	1.124 (28,55)	1.47
07	0.438 (11,13)	0.376 (9,55)	0.600 (15,24)	0.580 (14,73)	1.247 (31,67)	1.187 (30,15)	1.60
08	0.500 (12,70)	0.439 (11,15)	0.662 (16,81)	0.642 (16,31)	1.309 (33,25)	1.249 (31,72)	1.72
09	0.562 (14,27)	0.501 (12,73)	0.724 (18,39)	0.704 (17,88)	1.455 (36,96)	1.395 (35,43)	1.85
10	0.625 (15,88)	0.563 (14,30)	0.787 19,99	0.767 19,48	1.580 (40,13)	1.520 (38,61)	1.97
11	0.688 (17,48)	0.626 (15,90)	0.850 21,59	0.830 21,08	1.705 (43,31)	1.645 (41,78)	2.10
12	0.750 (19,05)	0.689 (17,50)	0.912 23,16	0.892 22,66	1.830 (46,48)	1.770 (44,96)	2.23
13	0.812 (20,62)	0.751 (19,08)	----	----	----	----	----
14	0.875 (22,22)	0.813 (20,65)	----	----	----	----	----
15	0.938 (23,83)	0.876 (22,25)	----	----	----	----	----
16	1.000 (25,40)	0.939 (23,85)	----	----	----	----	----

(Continued)

Table 3 : Grip lengths (continued)

Grip Dash Number	Grip range		Dia dash No 5				
			H		L		Mass
	(Max)	(Min)	(Max)	(Min)	(Max)	(Min)	grammes
03	0.188 (4,78)	0.126 (3,20)	0.467 (11,86)	0.447 (11,35)	1.215 (30,86)	1.155 (29,34)	3.94
04	0.250 (6,35)	0.189 (4,80)	0.529 (13,44)	0.509 (12,93)	1.277 (32,44)	1.217 (30,91)	4.24
05	0.312 (7,92)	0.251 (6,38)	0.591 (15,01)	0.571 (14,50)	1.339 (34,01)	1.279 (32,49)	4.64
06	0.375 (9,52)	0.313 (7,95)	0.654 (16,61)	0.634 (16,10)	1.402 (35,61)	1.342 (34,09)	4.97
07	0.438 (11,13)	0.376 (9,55)	0.717 (18,21)	0.697 (17,70)	1.465 (37,21)	1.405 (35,69)	5.32
08	0.500 (12,70)	0.439 (11,15)	0.779 (19,79)	0.759 (19,28)	1.527 (38,79)	1.467 (37,26)	5.66
09	0.562 (14,27)	0.501 (12,73)	0.841 (21,36)	0.821 (20,85)	1.589 (40,36)	1.529 (38,84)	6.01
10	0.625 (15,88)	0.563 (14,30)	0.904 (22,96)	0.884 (22,45)	1.652 (41,96)	1.592 (40,44)	6.36
11	0.688 (17,48)	0.626 (15,90)	0.967 (24,56)	0.947 (24,05)	1.715 (43,56)	1.655 (42,04)	6.71
12	0.750 (19,05)	0.689 (17,50)	1.029 (26,14)	1.009 (25,63)	1.895 (48,13)	1.835 (46,91)	7.06
13	0.812 (20,62)	0.751 (19,08)	1.091 (27,71)	1.071 (27,20)	2.020 (51,31)	1.960 (49,78)	7.40
14	0.875 (22,22)	0.813 (20,65)	1.154 (29,31)	1.134 (28,80)	2.145 (54,48)	2.085 (52,96)	7.75
15	0.938 (23,83)	0.876 (22,25)	1.217 (30,91)	1.197 (30,40)	2.270 (57,66)	2.210 (56,13)	8.10
16	1.000 (25,40)	0.939 (23,85)	1.279 (32,49)	1.259 (31,98)	2.395 (60,83)	2.335 (59,31)	8.45
17	1.062 (26,97)	1.001 (25,43)	1.341 (34,06)	1.321 (33,55)	2.520 (64,01)	2.460 (62,48)	8.79
18	1.125 (28,58)	1.063 (27,00)	1.404 (35,66)	1.384 (35,15)	2.645 (67,18)	2.585 (65,66)	9.14
19	1.188 (30,18)	1.126 (28,60)	1.467 (37,26)	1.447 (36,75)	2.770 (70,36)	2.710 (68,83)	9.49
20	1.250 (31,75)	1.189 (30,20)	1.529 (38,84)	1.509 (38,33)	2.895 (73,53)	2.835 (72,01)	9.84
21	1.312 (33,32)	1.251 (31,78)	----	----	----	----	----
22	1.375 (34,92)	1.313 (33,35)	----	----	----	----	----
23	1.438 (36,53)	1.376 (34,95)	----	----	----	----	----
24	1.500 (38,10)	1.439 (36,55)	----	----	----	----	----
(Continued)							

(Continued)

Table 3 : Grip lengths (concluded)

Grip Dash Number	Grip range		Dia dash No 6				
			H		L		Mass
	(Max)	(Min)	(Max)	(Min)	(Max)	(Min)	grammes
03	0.188 (4,78)	0.126 (3,20)	----	----	----	----	----
04	0.250 (6,35)	0.189 (4,80)	0.581 (14,76)	0.561 (14,25)	1.397 (35,48)	1.337 (33,96)	7.20
05	0.312 (7,92)	0.251 (6,38)	0.643 (16,33)	0.623 (15,82)	1.399 (35,53)	1.399 (35,53)	7.69
06	0.375 (9,52)	0.313 (7,95)	0.706 (17,93)	0.686 (17,42)	1.522 (38,66)	1.462 (37,13)	8.18
07	0.438 (11,13)	0.376 (9,55)	0.769 (19,53)	0.749 (19,02)	1.585 (40,26)	1.525 (37,74)	8.67
08	0.500 (12,70)	0.439 (11,15)	0.831 (21,11)	0.811 (20,60)	1.647 (41,83)	1.587 (40,31)	9.16
09	0.562 (14,27)	0.501 (12,73)	0.893 (22,68)	0.873 (22,17)	1.709 (43,41)	1.649 (41,88)	9.65
10	0.625 (15,88)	0.563 (14,30)	0.956 (24,28)	0.936 (23,77)	1.772 (45,01)	1.712 (43,48)	10.14
11	0.688 (17,48)	0.626 (15,90)	1.019 (25,88)	0.999 (25,37)	1.835 (46,61)	1.775 (45,09)	10.63
12	0.750 (19,05)	0.689 (17,50)	1.081 (27,46)	1.061 (26,95)	1.897 (48,18)	1.837 (46,66)	11.12
13	0.812 (20,62)	0.751 (19,08)	1.143 (29,03)	1.123 (28,52)	1.959 (49,76)	1.899 (48,23)	11.61
14	0.875 (22,22)	0.813 (20,65)	1.206 (30,63)	1.186 (30,12)	2.145 (54,48)	2.085 (52,96)	12.10
15	0.938 (23,83)	0.876 (22,25)	1.269 (32,23)	1.249 (31,72)	2.270 (57,66)	2.210 (56,13)	12.59
16	1.000 (25,40)	0.939 (23,85)	1.331 (33,81)	1.311 (33,30)	2.395 (60,83)	2.335 (59,31)	13.08
17	1.062 (26,97)	1.001 (25,43)	1.393 (35,38)	1.373 (34,87)	2.520 (64,01)	2.460 (62,48)	13.57
18	1.125 (28,58)	1.063 (27,00)	1.456 (36,98)	1.436 (36,47)	2.645 (67,18)	2.585 (65,66)	14.06
19	1.188 (30,18)	1.126 (28,60)	1.519 (38,58)	1.499 (38,07)	2.770 (70,36)	2.710 (68,83)	14.55
20	1.250 (31,75)	1.189 (30,20)	1.581 (40,16)	1.561 (39,65)	2.895 (73,53)	2.835 (72,01)	15.04
21	1.312 (33,32)	1.251 (31,78)	1.643 (41,73)	1.623 (41,22)	3.020 (76,71)	2.960 (75,18)	15.53
22	1.375 (34,92)	1.313 (33,35)	1.706 (43,33)	1.686 (42,82)	3.145 (79,88)	3.085 (78,36)	16.02
23	1.438 (36,53)	1.376 (34,95)	1.769 (44,93)	1.749 (44,42)	3.270 (83,06)	3.210 (81,53)	16.51
24	1.500 (38,10)	1.439 (36,55)	1.831 (46,51)	1.811 (46,00)	3.395 (86,23)	3.335 (84,71)	17.00
25	1.562 (39,67)	1.501 (38,13)	1.893 (48,08)	1.873 (47,57)	3.520 (89,41)	3.460 (87,88)	17.49
26	1.625 (41,28)	1.563 (39,70)	1.956 (49,68)	1.936 (49,17)	3.645 (92,58)	3.585 (91,06)	17.98

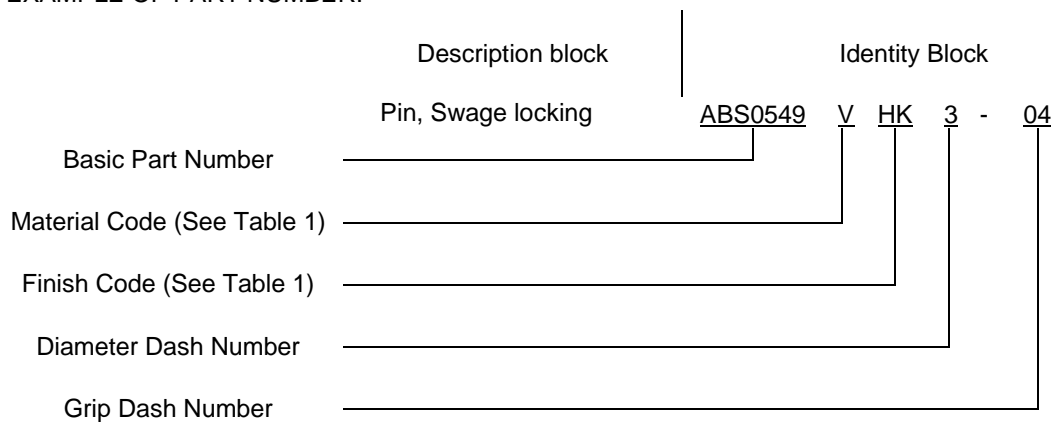
Table 4 : Mechanical Properties

Pin Part number	Nominal Dia.		Minimum Double Shear		Minimum Ultimate Tensile With Bush ASNA2025	
	(in)	(mm)	(lbf)	(N)	(lbf)	(N)
ABS0549VHK3-	0.190	4,83	5380	23931	1600	7117
ABS0549VHK4-	0.250	6,35	9300	41368	3000	13345
ABS0549VHK5-	0.312	7,92	14600	64944	5000	22241
ABS0549VHK6-	0.375	9,53	21000	93413	7000	31138

4 Designation

This type of Standard shall be designated according to the philosophy of the following example:

EXAMPLE OF PART NUMBER:



5 Marking

Marking shall be in accordance with EN2424 style B and the requirements of paragraph 3.1.5

6 Technical specification

HPS C 2010

RECORD OF REVISIONS

Issue	Clause modified	Description of modification
1 09/89	N/A	New Standard
2 04/08	All	<p>Grip Dash numbers 25 and 26 added to Diameter dash number 6. Document updated to comply with the latest requirements of AP2014.</p> <p>Minimum Double Shear strength for Diameter Dash 5 amended from 14000 lbf to 14600 lbf in accordance with the manufacturers drawing.</p> <p>Material Table added.</p> <p>Mass values added for all diameters.</p>