CORPORATE STANDARDIZATION	NORME D'ETUDES	ASNA0078
	RIVETS, BLIND, FLATTENED ROUND HEAD	Issue: **P** Date: **11.2008**

1 FIELD OF APPLICATION

The purpose of this ASN is to define the main characteristics of blind rivets with flattened round head, which can be attached by a single action.

2 NORMATIVE REFERENCES

QQ-A-430	Aluminium alloy rod and wire, for rivets and cold heading.
QQ-N-281	Nickel-copper alloy bar, rod, plate, sheet, strip, wire, forgings, and structural.
QQ-P-35	Passivation treatments for corrosion - resistant steel.
QQ-P-416	Plating, cadmium (electrodeposited).
AMS 5657	Steel bars and forgings, corrosion and moderate heat resistant 15 Cr - 7,1 Ni - 2,5 Mo - 1,1 Al.
AMS 5737	Steel bars, wire, forgings and tubing, corrosion and heat resistant 15 Cr - 25,5 Ni - 1,2 Mo - 2,1 Ti-0,006 B - 0,30 V consumable electrode melted 1650°F (899°C) - Solution and precipitation heat treated.
AMS 6322	Steel bars, forgings, and rings 0,50 Cr - 0,55 Ni - 0,25 Mo (0,38 - 0,43 C) (SAE 8740).
MIL-C-5541	Chemical conversion coatings on aluminium and aluminium alloys.
MIL-DTL-83488	Coating, aluminum, ion vapor deposited.
MIL-R-7885	Rivets, blind, structural, mechanically locked spindle and friction locked spindle, general specification for.
MIL-STD-1312-21	Fastener test methods method 21, shear joint fatigue.
NAS 1686	Rivet, blind, aluminium sleeve, mechanically locked spindle, bulbed.
NAS 1687	Rivet, blind, monel and inconel sleeve, mechanically locked spindle, bulbed.
IGC 04.81.104	Monograms of fastener manufacturers.

These documents shall be consulted at the latest issue in effect.

Keywords: Blind rivet (TC) – Round head rivet - Rivet

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3 REQUIRED CHARACTERISTICS

3.1 Configuration

These rivets are composed of 4 or 5 parts following on the manufacturer:

① A grooved end shank

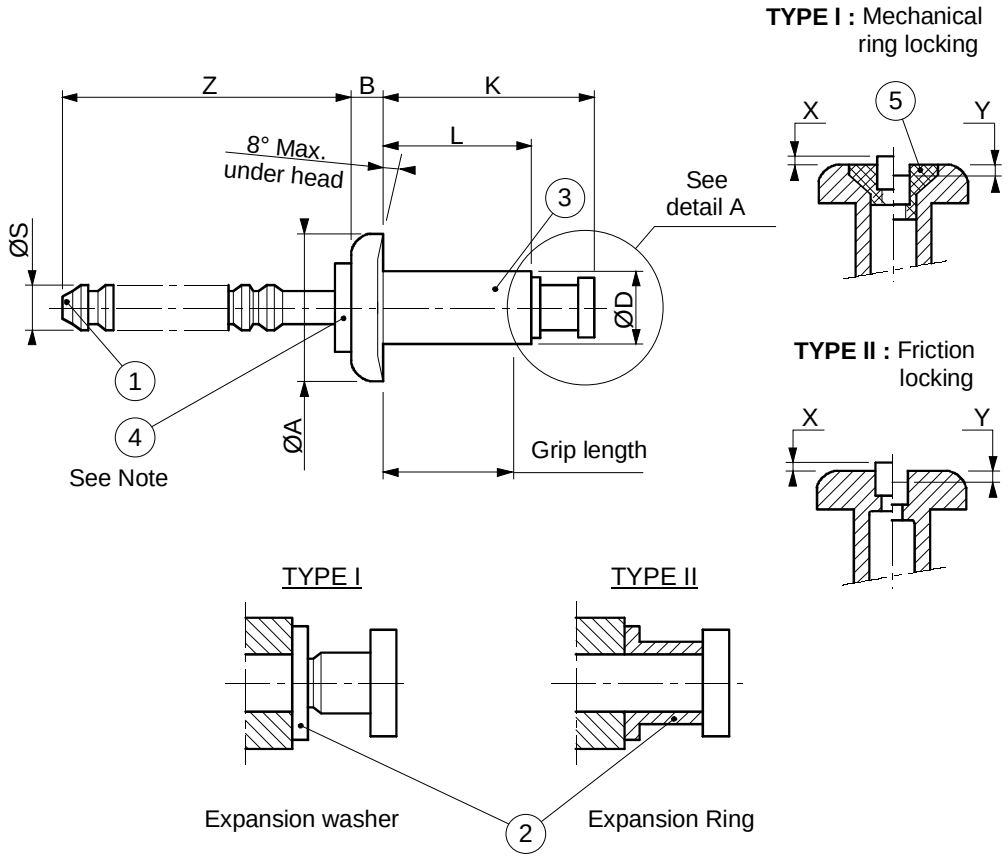
② Depending on the manufacturer: (form Optional)

- either an expansion washer,
- or an expansion ring.

③ A socket

④ An abutment washer

⑤ A retaining ring (depending on the manufacturer). (Form Optional)



NOTE – Coating of abutment washer:

- for rivets of standard diameter: GOLD coloured,
- for rivets of large diameter: SILVER coloured.

Dimensions in millimetres

FIGURE 1

3.2 Standard rivets: Dimensions – Length and grip length codes

TABLE 1 - Dimensions

Diameter code	Nominal diameter		D		A		B		S Ref.		Z		BK	
			+ .003 – .001	+ 0,076 – 0,025	± .010	± 0,254	+ .010 0	+ 0,254 0			min.		min.	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
4	1/8	3,2	.126	3,20	.250	6,35	.054	1,37	.073	1,85	.87	22,10	.355	9,02
5	5/32	4,0	.157	3,99	.312	7,92	.067	1,70	.091	2,31	.94	23,88	.370	9,40
6	3/16	4,8	.189	4,80	.375	9,52	.080	2,03	.110	2,79	.94	23,88	.415	10,54
8	1/4	6,4	.253	6,43	.500	12,70	.107	2,72	.146	3,71	.97	24,64	.485	12,32

TABLE 1 (cont'd)

Diameter code	X		Y	
	max.		max.	
	inch	mm	inch	mm
4	.010	0,25	.015	0,38
5	.010	0,25	.020	0,51
6	.010	0,25	.020	0,51
8	.015	0,38	.025	0,63

Minimum dimensions for rivet attachment

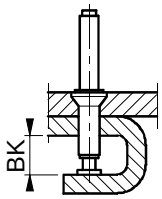


FIGURE 2

TABLE 2 – Length and grip length codes

Grip length code	Grip length				DIAMETER CODE											
					4						5					
					L		K		Mass [1]		L		K		Mass [1]	
	min.		max.		.000 - .030	0 - 0,76	max.		Code		.000 - .030	0 - 0,76	max.		Code	
									A-B	C-D E-F					A-B	C-D E-F
	inch	mm	inch	mm	inch	mm	inch	mm	g	g	Inch	mm	inch	mm	g	g
01	–		.062	1,57	.161	4,08	.38	9,65	0,31	0,53	.187	4,75	.41	10,41	.057	0,86
02	.063	1,60	.125	3,18	.224	5,69	.45	11,43	0,36	0,64	.230	5,84	.47	11,94	0,64	1,03
03	.126	3,20	.187	4,75	.287	7,29	.51	12,95	0,42	0,72	.293	7,44	.53	13,46	0,74	1,16
04	.188	4,78	.250	6,35	.349	8,86	.57	14,48	0,48	0,83	.355	9,02	.59	14,99	0,84	1,33
05	.251	6,37	.312	7,92	.412	10,46	.63	16,00	0,55	0,93	.418	10,62	.65	16,51	0,94	1,49
06	.313	7,95	.375	9,52	.474	12,04	.70	17,78	0,62	1,02	.480	12,19	.72	18,29	1,05	1,65
07	.376	9,55	.437	11,10	.537	13,64	.76	19,30	0,68	1,13	.543	13,79	.77	19,56	1,15	1,82
08	.438	11,13	.500	12,70	.599	15,21	.82	20,83	0,74	1,23	.605	15,37	.84	21,34	1,25	1,98
09	.501	12,73	.562	14,27	.662	16,81	.88	22,35	0,90	1,34	.668	16,97	.90	22,86	1,35	2,14
10	.563	14,30	.625	15,88	–	–	–	–	–	–	.730	18,54	.96	24,38	1,45	2,30
11	.626	15,90	.687	17,45	–	–	–	–	–	–	.793	20,14	1.02	25,91	1,55	2,46
12	.688	17,48	.750	19,05	–	–	–	–	–	–	–	–	–	–	–	–
13	.751	19,07	.812	20,62	–	–	–	–	–	–	–	–	–	–	–	–
14	.813	20,65	.875	22,22	–	–	–	–	–	–	–	–	–	–	–	–

1) The masses are calculated: attached rivet – selected shank.

TABLE 2 (cont'd)

Grip length code	Grip length				DIAMETER CODE											
					6						8					
					L		K		Mass[1)]		L		K		Mass [1)]	
	min.		max.		.000 - .030	0 - 0,76	max.		Code		.000 - .030	0 - 0,76	max.		Code	
									A-B	C-D E-F					A-B	C-D E-F
	inch	mm	inch	mm	inch	mm	inch	mm	g	g	inch	mm	inch	mm	g	g
01	–		.062	1,57	.219	5,56	.47	11,94	0,91	1,61	–	–	–	–	–	–
02	.063	1,60	.125	3,18	.262	6,65	.51	12,95	1,00	1,82	.315	8,00	.59	15,0	2,17	–
03	.126	3,20	.187	4,75	.325	8,26	.57	14,48	1,14	2,04	.378	9,60	.65	16,5	2,42	3,16
04	.188	4,78	.250	6,35	.387	9,83	.64	16,26	1,29	2,27	.440	11,20	.72	18,3	2,68	3,46
05	.251	6,37	.312	7,92	.450	11,43	.70	17,78	1,43	2,50	.503	12,80	.78	19,8	2,94	4,07
06	.313	7,95	.375	9,52	.512	13,00	.76	19,30	1,58	2,73	.565	14,35	.84	21,3	3,20	4,55
07	.376	9,55	.437	11,10	.575	14,61	.82	20,83	1,72	2,96	.628	15,95	.90	22,9	3,46	5,01
08	.438	11,13	.500	12,70	.637	16,18	.88	22,35	1,87	3,19	.690	17,50	.97	24,6	3,71	5,61
09	.501	12,73	.562	14,27	.700	17,78	.95	24,13	2,02	3,41	.753	19,10	1.03	26,2	3,97	5,90
10	.563	14,30	.625	15,88	.762	19,35	1.01	25,65	2,16	3,65	.815	20,70	1.09	27,7	4,23	6,18
11	.626	15,90	.687	17,45	.825	20,96	1.07	27,18	2,31	3,87	.878	22,30	1.15	29,2	4,49	7,17
12	.688	17,48	.750	19,05	.887	22,53	1.13	28,70	2,46	4,10	.940	23,90	1.22	31,0	4,79	7,61
13	.751	19,07	.812	20,62	–	–	–	–	–	–	1.003	25,50	1.28	32,5	5,00	8,04
14	.813	20,65	.875	22,22	–	–	–	–	–	–	1.065	27,05	1.34	34,0	5,26	8,47
1) The masses are calculated: attached rivet – selected shank.																

Diameter code	4		5		6	
	inch	mm	inch	mm	inch	mm
Min. grip length	.025	0,63	.031	0,78	.037	0,94

3.3 Rivets of large diameter: Dimensions – Length and grip length codes

TABLE 3 - Dimensions

Diameter code	Nominal diameter		D		A		B		S Ref.		Z		BK	
			+ .003 – .001	+ 0,076 – 0,025	± .010	± 0,254	+ .010 0	+ 0,254 0			min.		min.	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
4	1/8	3,2	.140	3,55	.250	6,35	.054	1,37	.081	2,06	.67	22,10	.390	9,90
5	5/32	4,0	.173	4,39	.312	7,92	.067	1,70	.100	2,54	.94	23,88	.395	10,00
6	3/16	4,8	.201	5,10	.375	9,52	.080	2,03	.117	2,97	.94	23,88	.410	10,40
8	1/4	6,4	.267	6,78	.500	12,70	.107	2,72	.158	4,01	.96	24,38	.490	12,40

TABLE 3 (cont'd)

Diameter code	X		Y	
	max.		max.	
	inch	mm	inch	mm
4	.010	0,25	.015	0,38
5	.010	0,25	.020	0,51
6	.010	0,25	.020	0,51
8	.015	0,38	.025	0,63

Minimum dimensions for rivet attachment

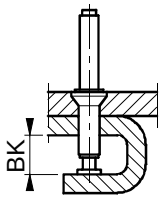


FIGURE 3

TABLE 4 – Length and grip length codes

Grip length code	Grip length				DIAMETER CODE											
					4						5					
					L		K		Mass [1]		L		K		Mass [1]	
	min.		max.		.000 - .030	0 - 0,76	max.		Code		.000 - .030	0 - 0,76	max.		Code	
									A-B	C-D E-F					A-B	C-D E-F
	inch	mm	inch	mm	inch	mm	inch	mm	g	g	inch	mm	inch	mm	g	g
01	–		.062	1,57	.175	4,44	.37	9,39	0,40	0,66	.203	5,16	.43	10,92	0,70	1,07
02	.063	1,60	.125	3,18	.238	6,04	.46	11,68	0,45	0,80	.246	6,25	.47	11,94	0,77	1,26
03	.126	3,20	.187	4,75	.301	7,64	.52	13,21	0,53	0,90	.309	7,85	.53	13,46	0,90	1,43
04	.188	4,78	.250	6,35	.363	9,22	.58	14,73	0,60	1,03	.371	9,42	.60	15,24	1,02	1,64
05	.251	6,37	.312	7,92	.426	10,82	.65	16,51	0,68	1,16	.434	11,02	.66	16,76	1,14	1,84
06	.313	7,95	.375	9,52	.488	12,39	.71	18,03	0,75	1,28	.496	12,60	.72	18,29	1,26	2,04
07	.376	9,55	.437	11,10	.551	13,99	.78	19,81	0,83	1,41	.559	14,20	.79	20,06	1,38	2,24
08	.438	11,13	.500	12,70	.613	15,57	.84	21,34	0,91	1,53	.621	15,77	.85	21,59	1,50	2,44
09	.501	12,73	.562	14,27	.676	17,17	.90	22,86	0,99	1,66	.684	17,37	.91	23,11	1,62	2,63
10	.563	14,30	.625	15,88	–	–	–	–	–	–	.746	18,95	.98	24,89	1,75	2,83
11	.626	15,90	.687	17,45	–	–	–	–	–	–	.809	20,54	1.04	26,42	1,87	3,03
12	.688	17,48	.750	19,05	–	–	–	–	–	–	–	–	–	–	–	–
13	.751	19,07	.812	20,62	–	–	–	–	–	–	–	–	–	–	–	–
14	.813	20,65	.875	22,22	–	–	–	–	–	–	–	–	–	–	–	–

1) The masses are calculated: attached rivet – selected shank.

TABLE 4 (cont'd)

Grip length code	Grip length				DIAMETER CODE											
					6						8					
					L		K		Mass [1]		L		K		Mass [1]	
	min.		max.		.000 - .030	0 - 0,76	max.		Code		.000 - .030	0 - 0,76	max.		Code	
									A-B	C-D E-F					A-B	C-D E-F
	inch	mm	inch	mm	Inch	mm	inch	mm	g	g	inch	mm	inch	mm	g	g
01	–		.062	1,57	.242	6,15	.45	11,43	1,08	1,87	–	–	–	–	–	–
02	.063	1,60	.125	3,18	.265	6,73	.50	12,70	1,17	2,10	–	–	–	4,49	–	–
03	.126	3,20	.187	4,75	.328	8,33	.55	13,97	1,33	2,36	.375	9,50	.64	16,30	2,60	4,96
04	.188	4,78	.250	6,35	.390	9,91	.62	15,75	1,48	2,63	.437	11,10	.70	17,80	2,98	5,43
05	.251	6,37	.312	7,92	.453	11,51	.68	17,27	1,64	2,89	.500	12,70	.77	19,60	3,23	5,90
06	.313	7,95	.375	9,52	.515	13,08	.74	18,80	1,80	3,16	.562	14,30	.83	21,10	3,54	6,36
07	.376	9,55	.437	11,10	.578	14,68	.82	20,83	1,96	3,42	.625	15,90	.89	22,60	3,84	6,83
08	.438	11,13	.500	12,70	.640	16,26	.89	22,61	2,12	3,69	.687	17,45	.95	24,10	4,13	7,30
09	.501	12,73	.562	14,27	.703	17,86	.95	24,13	2,27	3,95	.750	19,05	1.02	25,90	4,41	7,77
10	.563	14,30	.625	15,88	.765	19,43	1.01	25,65	2,42	4,22	.812	20,60	1.08	27,40	4,70	8,23
11	.626	15,90	.687	17,45	.828	21,03	1.07	27,19	2,59	4,48	.875	22,20	1.14	29,00	4,98	8,70
12	.688	17,48	.750	19,05	.890	22,61	1.14	28,96	2,75	4,74	.937	23,80	1.20	30,50	5,27	9,17
13	.751	19,07	.812	20,62	–	–	–	–	–	–	1.000	25,40	1.27	32,25	5,56	9,63
14	.813	20,65	.875	22,22	–	–	–	–	–	–	1.062	27,00	1.60	40,65	5,84	10,10

1) The masses are calculated: attached rivet – selected shank.

Diameter code	4		5		6	
	inch	mm	inch	mm	inch	mm
Min. grip length	.025	0,63	.031	0,79	.037	0,94

3.4 Material – Surface treatment

TABLE 5

CODE	MATERIAL				SURFACE TREATMENT				Maximum Operating Temperature	Light Colour
	Socket	Shank	Retaining Ring (2)	Expansion Ring (2)	Socket	Shank	Retaining Ring	Expansion Ring		
A	Aluminium Alloy 5056 QQ-A-430	Steel Alloy 8740 AMS 6322	Stainless Steel A286 AMS 5737	Steel Alloy SAE 1038	MIL-C-5541 Light Colour	Cadmium Plated QQ-P-416 Type II Cl. 2	Passivate per QQ-P-35	Cadmium Plated QQ-P-416 Type I Cl. 2 Passivate per QQ-P-35 for A286. Stainless Steel and for 300 CRES ASTM A493.	120℃	None
B	Aluminium Alloy 5056 QQ-A-430	Stainless Steel 15.7 PH AMS 5657 or Stainless Steel A286 AMS 5737				Passivate per QQ-P-35 for A286. No finish for Stainless Steel 15.7				
C [1]	Monel QQ-N-281	Stainless Steel 15.7 PH AMS 5657 or Stainless Steel A286 AMS 5737		Monel QQ-N-281	None	Passivate per QQ-P-35 for A286. No finish for Stainless Steel 15.7		None	492℃	
D [1]					I.V.D. [2] MIL-DTL-83488 Type II Cl. 3				400℃	Gold
E					None				492℃	None
F					I.V.D. [2] MIL-DTL-83488 Type II Cl. 3				400℃	Gold

1) Codes C and D shall not to used for new design studies. Valid until stocks are exhausted.
I.V.D. (Ion Vapor Deposition: protection by deposition of aluminium under vacuum).
2) When used

3.5 Tensile and shear strength

TABLE 6

Material finish code	STANDARD RIVETS											
	Ø code	4					5					
		02	03	04	05	06	02	03	04	05	06	07
A and B	Single shear strength min. (N)	2246	2598	2914	2954		3109	3736	4132	4537	4582	
	Tensile strength (N)	(4) 1268					(4) 1979					
C and D	Single shear strength min. (N)	2874	3247	3247	3247		3923	5044	5044	5044	5044	
	Tensile strength (N)	(4) 1779					(4) 2825					
E and F	Single shear min. (N)	2896	3763	4426	4426	4426	3950	5026	6116	6872	6872	6872
	Tensile strength (N)	(4) 1779					(4) 2825					
RIVETS OF LARGE DIAMETER												
A and B	Single shear min. (N))	2633	3078	3429	3621		3567	4368	4804	5227	5538	
	Tensile strength (N)	(4) 1535					(4) 2357					
C and D	Single shear min. (N)	3336	3981	3981	3981		4515	5738	6018	6018	6018	
	Tensile strength (N)	(4) 2179					(4) 3291					
E and F	Single shear min. (N)	3340	4306	5271	5427	5427	4537	5716	6917	8095	8296	8296
	Tensile strength (N)	(4) 2179					(4) 3291					

Notes :

1) The values indicated in the table above are only valid for assemblies using sheets of the given thickness. The values shall take into account the thickness of the sheet used.
2) For rivets with a grip length greater than those indicated, take as the base the final value given in the table for the appropriate diameter.
3) Codes C and D shall not be used for new design studies. Valid until stocks are exhausted.
4) Applies to grips 4-03 max., 5-03 max., 6-04 max. and up.

TABLE 6 (cont'd)

Material finish code	Ø Code	6						8							
		03	04	05	06	07	08	03	04	05	06	07	08	09	10
A and B	Single shear min. (N)	5026	5560	6027	6494	6583		8896	9643	10244	10898	11632	11632		
	Tensile strength (N)	(4) 2825						(4) 5004							
C et D	Single shear min. (N)	6396	7233	7233	7233	7233		9577	11312	12788					
	Tensile strength (N)	(4) 3959						(4) 6984							
E and F	Single shear min. (N)	6450	7740	9029	9852	9852	9852	9652	11387	13121	14901	16635	17436	17436	17436
	Tensile strength (N)	(4) 3959						(4) 6984							
RIVETS OF LARGE DIAMETER															
A and B	Single shear min. (N)	5516	6161	6694	7184	7495		8362	9674	10520	11209	11898	12566	13010	
	Tensile strength (N)	(4) 3158						(4) 5604							
C and D	Single shear min. (N)	7006	8109	8109	8109	8109									
	Tensile strength (N)	(4) 4448						(4) 7806							
E and F	Single shear min. (N)	7051	8451	9830	11231	11231	11231	10497	12320	14145	16057	17859	19527	19527	19527
	Tensile strength (N)	(4) 4448						(4) 7806							

Notes :

1) The values indicated in the table above are only valid for assemblies using sheets of the given thickness. The values shall take into account the thickness of the sheet used.

2) For rivets with a grip length greater than those indicated, take as the base the final value given in the table for the appropriate diameter.

3) Codes C and D shall not be used for new design studies. Valid until stocks are exhausted.

4) Applies to grips 4-03 max., 5-03 max., 6-04 max. and up.

4 DESIGNATION

Each blind rivet shall be designated as follows.

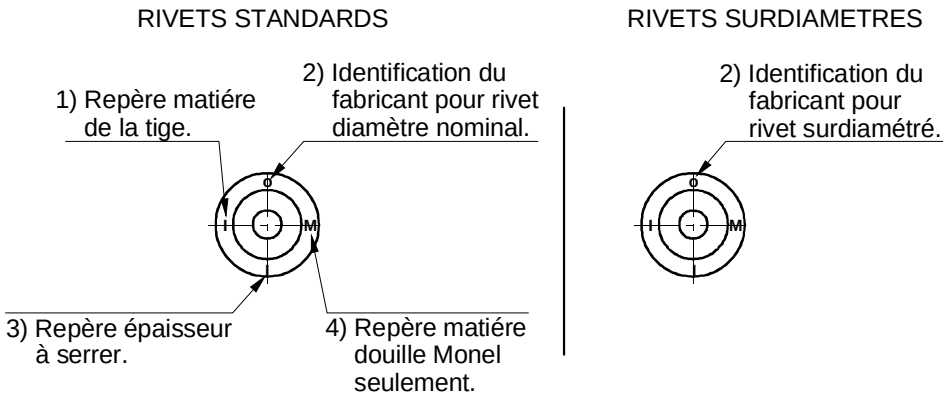
4.1 New designation

Description block[1)]	Identifier block[2)]
BLIND RIVET	ASNA0078 A 4 03 X

Number of the standard
Material code – Surface treatment (See 3.4)
Diameter code (see 3.2 or 3.3)
Grip length code (see 3.2 or 3.3)
Code for rivets of large diameter

NOTE – Where necessary, the company code F5442[3)] shall be specified between the description block and the identifier block.

5 MARKING



The marking on the rivet head includes the following:

1) No code for steel shanks.

   a + sign for rivets with stainless steel shanks and aluminium alloy sockets.

2) The manufacturer's monogram (see IGC 04.81.104).
3) The grip length code.
4) The socket material code (M) for Monel sockets only.

[1)] Optional.
[2)] The identifier block shall be written without spaces. Those in the example are intended to facilitate reading.
[3)] Company code assigned to EADS Corporate Standardization. F5442 is the designer's code for the present standard.

6 TECHNICAL SPECIFICATIONS

NAS 1686 or MIL-R-7885: for rivets of material code A and B depending on the manufacturer.

MIL-R-7885: for rivets of code C and D, until stocks are exhausted.

NAS 1687: for rivets of material code E and F except for the shear test MIL-STD-1312 test 21.

7 MANUFACTURERS

Refer to the list of qualified manufacturers and products.

RECORD OF REVISIONS

Issue [1)]	Paragraph Modified	Description of modification	Reason
E (09.83)		Manufacturer's identification added for rivets of large diameter Monel socket protection: cadmium plating replaced by I.V.D.: Protect ion for stainless steel shank with socket. Monel: cadmium plating deleted.	Restricted circulation. Aircraft Division only.
F (12.83)		Manufacturer's identification added for rivets of large diameter Monel socket protection: cadmium plating replaced by I.V.D. Protection for stainless steel shank with socket. Monel: cadmium plating deleted Diameter 6.4 added.	
G (06.85)		Mention of articles protected by patent law added. Marking: – Manufacturer's initials added after IGC. Related information 1 and 2 – Manufacturer added as per PQ 001.05 – Example of reference correspondence. AEROSPATIALE and manufacturer deleted.	
H (01.90)	2 4.4 4.5 5	Standard revised References : MIL-R-007885 specification changed for: Material codes A and B: NAS 1686 Material codes C and D: MIL-R-7885 Material codes E and F: NAS 1687 Material codes E and F added. Codes C and D changed to: Not to be used for new design studies. Valid until stocks are exhausted. Table revised following change in specification. Old designation replaced by new designation for new design studies.	CN/DIR 1 AECMA rules applied. Manufacturer's request following change in specification. Aircraft Division request.
J (03.91)	4.2 Tableau 2 4.3 Tableau 4	Grip length code added for ∅ 5. Grip length code added for ∅ 5.	Aircraft Division request.
K (03.97)	7	Technical specification: MIL-R-7885 revalidated for material codes A and B.	Second procurement source added Aircraft Division request.
L (09.95)	2 3.4 Figure 1	Standard references added. Material A286 added alternately with stainless steel 15.7 PH for code B. Detail added..	Manufacturer's request.

1) The issue I, O, X, Q and Z are not used

RECORD OF REVISIONS

Issue [1)]	Paragraph modified	Description of modification	Reason
M (09.96)	2 3.4 Table 5	Reference QQ-P-35 added. Surface treatment on shank - Code B. Passivation as per QQ-P-35 added for stainless steel A286.	DCR/N initiative.
N (09.97)	6 Table 6	For rivets of codes C and D: technical specification NAS 1686 replaced by MIL-R-7885. For rivets of codes E and F: shear test as per MIL-STD-1312 test 21 added. Shear value for ∅8-06 20898 replaced by 10898.	Manufacturer's request.
P	Pages 1– 10 3.4 table 5 Table 6	Aerospatiale becomes EADS Material/shank and Expansion ring change for codes C,D,E,F Surface treatment/shank change for codes B,C,D,E,F Surface treatment/Retaining ring changes for all codes Surface treatment/ Expansion ring changes for codes A,B. For standard rivets codes A and B, shear values change for ∅5-05, 5-06, 6-xx. For rivets of large diameter codes A and B, shear values change for ∅5-xx, 6-04, 6-05, 6-06 and tensile value changes for ∅5	Group trade name modified. Airbus request on 05/2008

1) The issue I, O, X, Q and Z are not used