

51

**STANDARD
PRACTICES
STRUCTURES**

LIST OF EFFECTIVE PAGES

CHAPTER	PAGE	DATE	CHAPTER	PAGE	DATE	
■ 51-LEP (BA)	1	SEP 04	■	207	SEP 04	
	2	OCT 02		208	SEP 04	
■ 51-TC (BA)	1	SEP 04		209	SEP 04	
	2	SEP 04		210	SEP 04	
51-00-00 (BA)	1	OCT 97		211	SEP 04	
	2	OCT 97		212	SEP 04	
51-30-00 (BA)	1	SEP 91		213	SEP 04	
	2	SEP 91		214	SEP 04	
■ 51-30-01 (BA)	201	SEP 04		215	SEP 04	
	202	SEP 04		216	SEP 04	
	203	SEP 04		51-50-00 (BA)	1	SEP 91
	204	SEP 04		2	SEP 91	
	205	SEP 04	51-50-01 (BA)	601	OCT 02	
	206	SEP 04	602	OCT 02		
■ 51-30-02 (BA)	201	SEP 04	603	OCT 02		
	202	SEP 04	604	OCT 02		
	203	SEP 04	605	OCT 02		
	204	SEP 04	606	OCT 02		
	205	SEP 04	51-60-00 (BA)	601	OCT 02	
	206	SEP 04	602	OCT 02		
	207	SEP 04	603	SEP 04		
	208	SEP 04	604	SEP 04		
	209	SEP 04	605	SEP 04		
	210	SEP 04	606	SEP 04		
51-40-00 (BA)	1	SEP 91	607	SEP 04		
	2	SEP 91	608	SEP 04		
51-40-01 (BA)	201	APR 95				
	202	APR 95				
	203	APR 95				
	204	APR 95				
■ 51-40-02 (BA)	201	SEP 04				
	202	SEP 04				
	203	SEP 04				
	204	SEP 04				
	205	SEP 04				
	206	SEP 04				

AAAA
Validity : S / N 1 - 9999

PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

SUBJECT	CHAPTER	PAGE	VALIDITY
STANDARD PRACTICES / STRUCTURES	51-00-00 (BA)	1	1 - 9999
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
MATERIALS	51-30-00 (BA)	1	All
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
MAIN SKINS	51-30-01 (BA)	201	1 - 9999
MAINTENANCE PRACTICES		201	
1. QUALITIES AND THICKNESS OF MAIN SKINS		201	
2. SKIN MATERIAL CHARACTERISTICS		204	
3. MATERIAL CROSS-REFERENCE TABLES		205	
A. Steels		205	
B. Aluminum alloys		205	
COMPOSITE MATERIALS	51-30-02 (BA)	201	1 - 9999
MAINTENANCE PRACTICES		201	
1. GENERAL		201	
2. LOCATION OF COMPOSITE AREAS		201	
3. REPAIRS		204	
A. Laminate elements		204	
B. Heat formed plastic elements (ABS - IMPAX 7000 - ALLAX SC)		205	
C. Honeycomb sandwich elements		208	
FASTENERS	51-40-00 (BA)	1	All
DESCRIPTION AND OPERATION		1	
1. GENERAL		1	
HARDWARE (SCREWS AND BOLTS)	51-40-01 (BA)	201	1 - 9999
1. GENERAL		201	
A. Drilling diameters		201	
B. Standard or currently used screws		201	
C. Hex head calibrated screws		201	
D. "Repair" sizes		202	
E. Standard nuts		202	
F. Self-locking nuts		202	
G. Special nuts		203	

AAAA

Validity : S / N 1 - 9999

SUBJECT	CHAPTER	PAGE	VALIDITY
RIVETS	51-40-02 (BA)	201	1 - 9999
1. GENERAL		201	
A. Solid rivets		201	
B. Blind rivets		201	
C. "AVDELOCK" rivets Z00. N 5529 / Z00. N 5675		202	
D. Rivet sizes		202	
E. Drilling diameters		214	
F. General advice for riveting		214	
G. Repair of countersunk and unsettled rivets		214	
INVENTORY OF DAMAGE	51-50-00 (BA)	1	All
1. GENERAL		1	
2. VISUAL INSPECTION		1	
3. MEASUREMENTS - TRIANGULATION - LEVELING		1	
ALIGNMENT AND SYMMETRY INSPECTION / CHECK	51-50-01 (BA)	601	1 - 9999
1. ALIGNMENT AND SYMMETRY CHECKS		601	
A. Tools and consumable materials		601	
B. Location of check points		601	
C. Procedure		602	
BALANCING OF CONTROL SURFACES INSPECTION / CHECK	51-60-00 (BA)	601	1 - 9999
1. CHECK OF CONTROL SURFACE BALANCING		601	
A. Tools and consumable materials		601	
B. Preliminary steps		601	
C. Aileron balancing check procedure		601	
D. Elevator balancing check procedure		602	
E. Rudder balancing check procedure		602	
2. BALANCING RE-ADJUSTMENT		603	
A. Tools and consumable materials		603	
B. Elevator balancing re-adjustment procedure		603	
C. Rudder balancing re-adjustment procedure		603	
D. Aileron balancing re-adjustment procedure		604	

STANDARD PRACTICES / STRUCTURES

DESCRIPTION AND OPERATION

1. GENERAL

This chapter describes special approved repairs, typical approved repairs, materials, damage classification, fasteners and the procedures applicable to the aircraft structures hereafter.

Aircraft structure features all metall construction and conventional design, incorporating aluminum alloys, steel and other materials as appropriate.

- Fuselage : the cabin portion is constructed with metal panels assembled to form a rigid structure. Metal floor panels extend the length of the cabin area and baggage compartment. The aft fuselage is constructed of sheet aluminum alloy panels which form a semi-monocoque structure - refer to 53-00-00.
- Doors and landing gear doors are provided in fuselage. For cabin door and front baggage compartment - see 52-00-00.
- The fuselage is provided with windows. The windows consists of windshield, cabin door window and cabin windows.
- The empennage structure consists of horizontal and vertical stabilizers. Fixed stabilizers consist of spars, ribs and skins - see 55-00-00.
- The wing structure consists of spars, ribs and skins. Wing structure provides attach fittings for the main landing gear, aileron and flap. Wing incorporates a sealed structure for fuel storage - see 57-00-00.

PAGE INTENTIONALLY LEFT BLANK

MATERIALS

DESCRIPTION AND OPERATION

1. GENERAL

This chapter concerns the materials used in the aircraft structure. Most of them are aluminum alloys. Others such as steel alloys and composites are also used. Sealants ensure cabin and tank sealing.

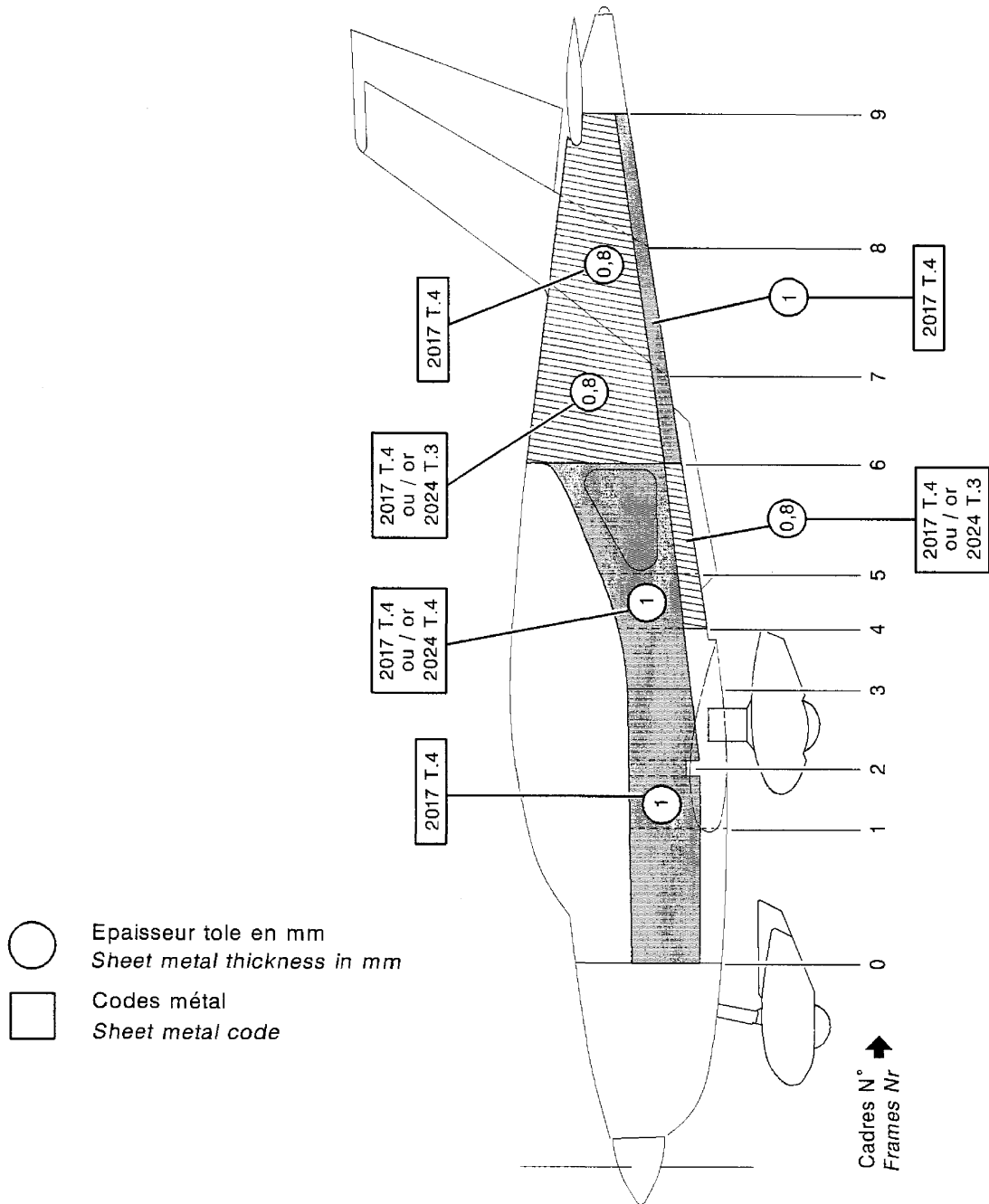
COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Main skins	/	/	/	51-30-01
Composite materials	/	/	/	51-30-02

PAGE INTENTIONALLY LEFT BLANK

MAIN SKINS

MAINTENANCE PRACTICES

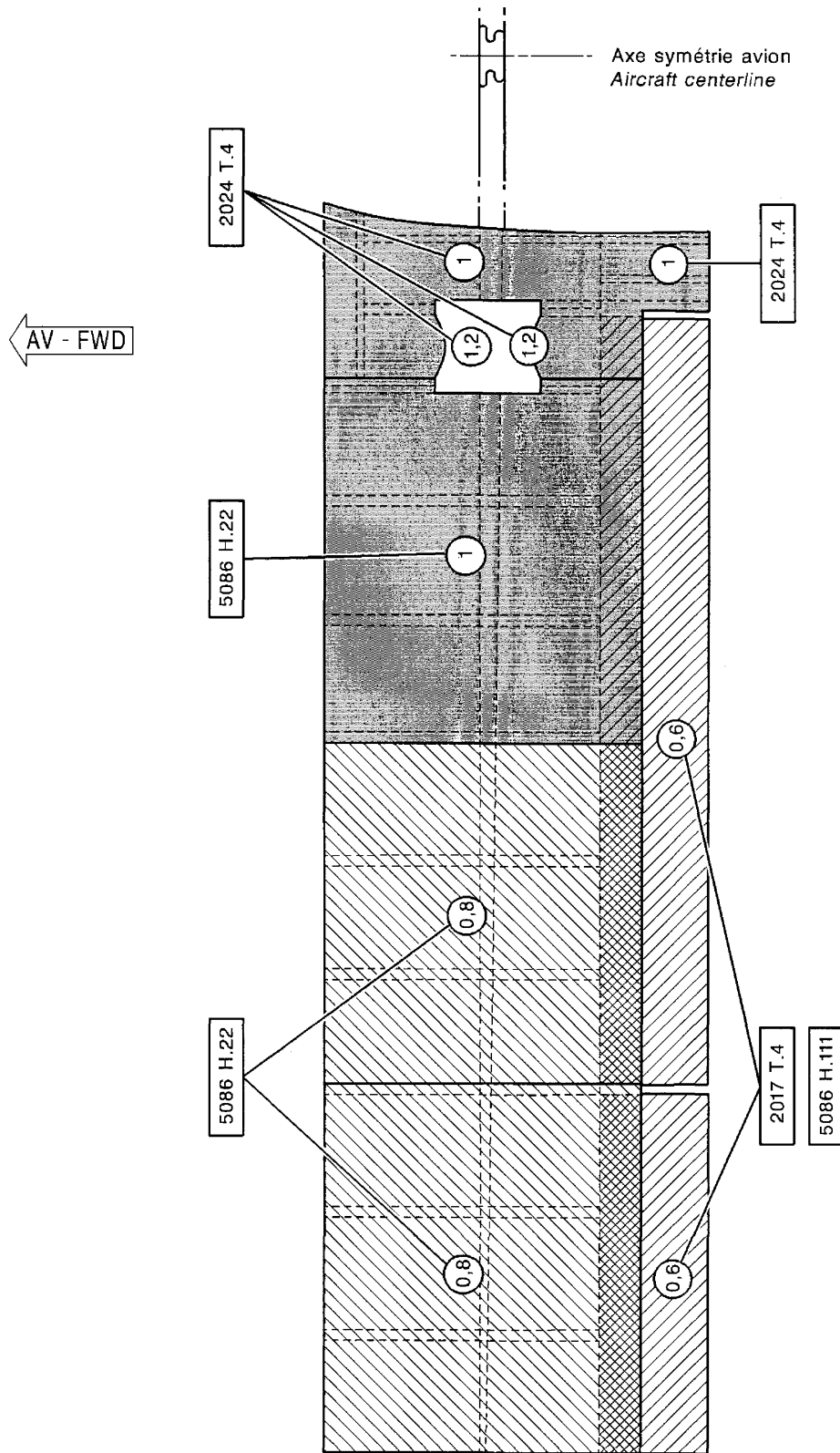
1. QUALITIES AND THICKNESS OF MAIN SKINS



14513001AAAAVZ4000

Fuselage skins
Figure 201

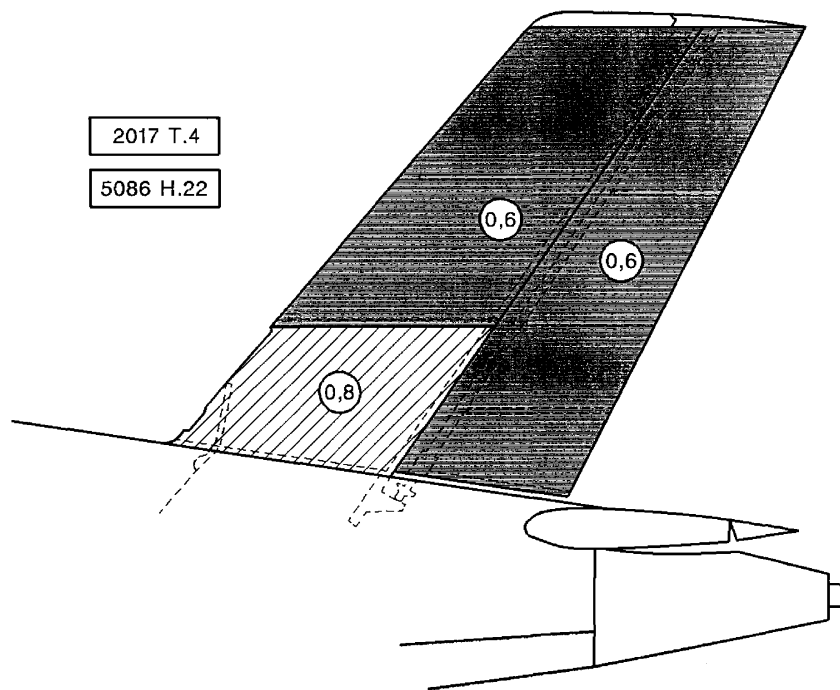
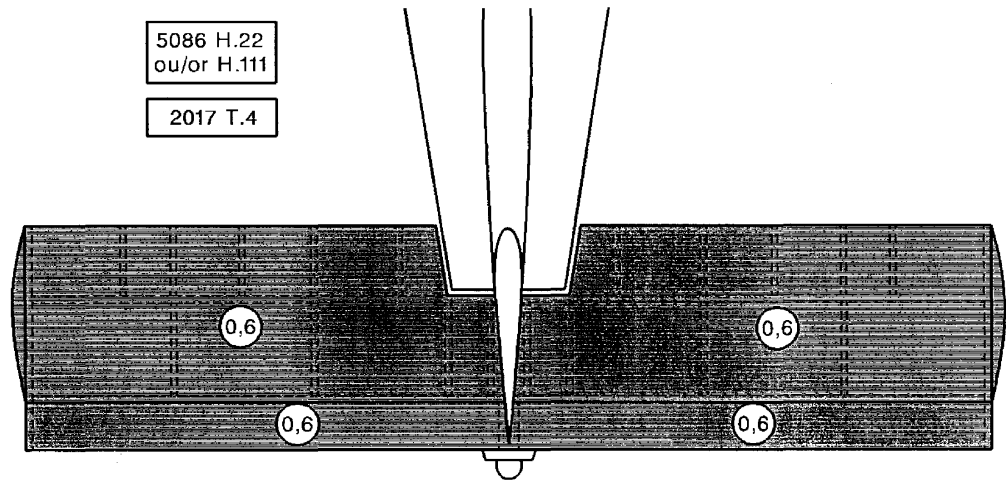
AAAA
Validity : S / N 1 - 9999



Wing skins
Figure 202

14513001AAAAVZ4200

AAAA
Validity : S / N 1 - 9999



14513001AAAAVZ14100

Skins of empennages
Figure 203

AAAA
Validity : S / N 1 - 9999

2. SKIN MATERIAL CHARACTERISTICS

MATERIAL CODE AND METALLURGICAL CONDITION	BASIC TREATMENT	* T.S. MPa		* Y.S. MPa	*EI %
		Min	Max		
5086 H.111	Annealed	240	290	100	18
5086 H.22	Quarter hard	280	330	190	8
2017 T.4	Quenched, rolled, aged	390		250	14
2024 T.4	Quenched, rolled, aged	430		270	14
2024 T.3	Quenched, work-hardened, aged	440		290	14

* T.S. MPa : Tensile strength in megapascal

* Y.S. MPa : Yield strength in megapascal

* EI % : Elongation

NOTE : Material code correspondences - see Paragraph 3.

3. MATERIAL CROSS-REFERENCE TABLES

A. Steels

FRANCE	GERMANY DIN	USA SAE-AISI ASTM	U.K. B.S	SPAIN UNE
A - 50	St.50	A 306	4360	A 490
XC18S	/	1017	En. 2 D / 3	F 1511
15CDV6	1.7734 Werkstoff	/	/	FE.PL.525 AECMA
18M5 (TU52b)	St 52.4	API.5A	/	/
25CD4S	25CrMo4	4125	En.20 A	F 222
30NCD16	30NiCrMo16	/	En.30 B	F 1260
35NC6f	36NiCr6	3135	En.110	/

B. Aluminum alloys

FRANCE	GERMANY DIN	USA SAE-AISI ASTM	U.K. B.S	SPAIN UNE
AG4MC	/	5086	1470 / NS8	/
AG5	3.3555	5056	N6	L.3320
AU4G	3.1325	2017	L 102	L.3120
AU4G1	3.1354	2024	3L 65	L.3140

AAAA

Validity : S / N 1 - 9999

51-30-01

Page 205
(BA) SEP 04

PAGE INTENTIONALLY LEFT BLANK

COMPOSITE MATERIALS MAINTENANCE PRACTICES

1. GENERAL

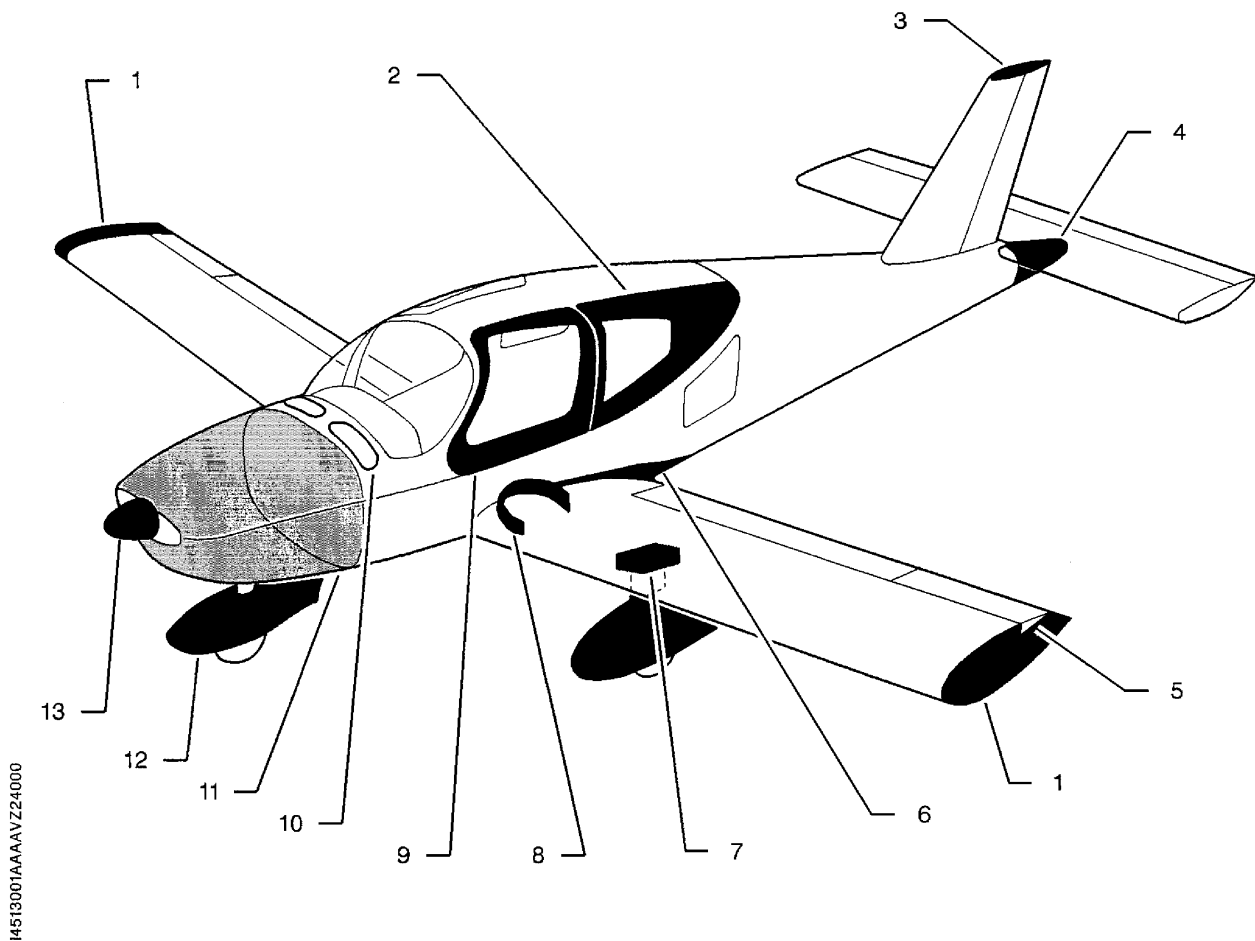
This chapter regroups the different defects which can be found on composite material parts when used. It defines a principle of repair for each of these defects.

2. LOCATION OF COMPOSITE AREAS - see Figure 201

Item	DESCRIPTION	AIRCRAFT TYPE				VALIDITY S / N	MATERIALS
		TB9 TB10	TB200	TB20	TB21		
1	WING TIP	X		X		1 - 822	ABS HEAT FORMED PLASTIC
		X	X	X		823	IMPAX 7000 ALLAX SC
					X	1 - 947	EPOXY + HONEYCOMB LAMINATE
			X		X	948	IMPAX 7000 ALLAX SC
2	UPPER DUCT SIDE PART	X	X	X	X	1	LAMINATE POLYESTER
3	EMPENNAGE TIP	X	X			1	LAMINATE POLYESTER
4	TAIL CONE	X				1 - 274	ABS HEAT FORMED PLASTIC
		X	X	X	X	275	LAMINATE POLYESTER
5	AILERON CLOSING RIB	X	X	X	X	1	ABS HEAT FORMED PLASTIC
6	KARMAN	X	X	X	X	1	LAMINATE POLYESTER
7	L / G LEG ATTACHMENT FAIRING	X	X			1	ABS HEAT FORMED PLASTIC
8	WHEEL WELL FAIRING			X	X	1 - 822	ABS HEAT FORMED PLASTIC
				X	X	823	IMPAX 7000 ALLAX SC
9	CABIN ACCESS DOOR	X				1 - 274 (2)	LAMINATE POLYESTER
10	DOOR FRAME IN FRONT OF WINDSHIELD	X	X	X	X	1	LAMINATE POLYESTER
11	ENGINE COWLING	X	X	X		1	SELF-EXTINGUISHING LAMINATE POLYESTER
					X	1	SELF-EXTINGUISHING LAMINATE POLYESTER
12	WHEEL FAIRING	X	X			1	LAMINATE POLYESTER
13	SPINNER	X				1 - 157 (1)	ABS HEAT FORMED PLASTIC (NOT REPAIRABLE)

PAGE INTENTIONALLY LEFT BLANK

- 1 - Wing tip
- 2 - Upper duct side part
- 3 - Empennage tip
- 4 - Tail cone
- 5 - Aileron closing rib
- 6 - Karman
- 7 - L / G leg attachment fairing
- 8 - Wheel well fairing
- 9 - Cabin access door
- 10 - Door frame in front of windshield
- 11 - Engine cowling
- 12 - Wheel fairing
- 13 - Spinner



Location of composite materials areas
Figure 201

3. REPAIRS

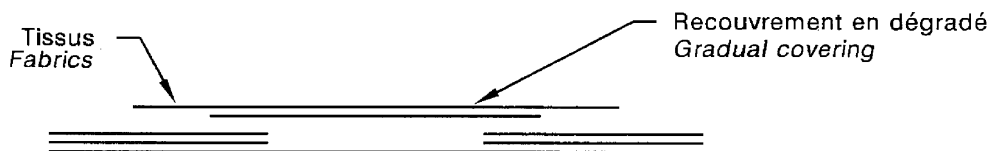
A. Laminate elements

Materials approved for repairs :

- Glass fabric (TB 23-900),
- Epoxy resin (TB 08-926 or TB 08-932) or polyester resin (TB 08-927) depending on kind of damaged part - see Paragraph 2.

1) Defect 1 : surface defect

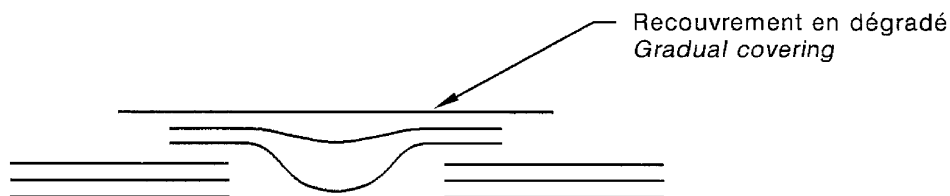
- Sand the defect until it disappears as well as the covering area with sandpaper,
- Cover the polished area with N* glass fabrics (TB 23-900) impregnated with resin (TB 08-926) or (TB 08-927) or (TB 08-932),
- Deburr and sand with sandpaper (TB 05-916).



I4513002AAAABVZ4000

2) Defect 2 : perforation

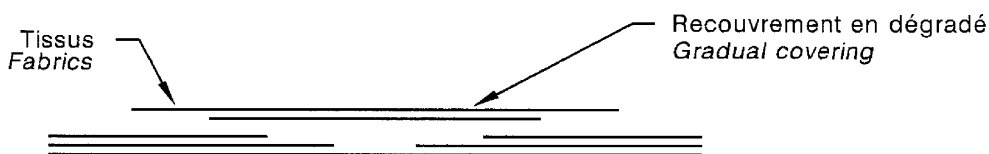
- Round the defect to a larger diameter,
- Sand the covering area with sandpaper (TB 05-916),
- Cover the perforated and sanded area with N* glass fabrics (TB 23-900) impregnated with resin (TB 08-926) or (TB 08-927) or (TB 08-932),
- Deburr and sand with sandpaper (TB 05-916).



I4513002AAAABVZ4100

3) Defect 3 : score (groove in surface, of variable depth and length)

- Cover the score with N* glass fabrics (TB 23-900) impregnated with resin (TB 08-926) or (TB 08-927) or (TB 08-932) after having sanded the covering area with sandpaper,
- Deburr and sand with sandpaper (TB 05-916).



I4513002AAAABVZ4200

N* : From 1 to 4 depending on defect depth

B. Heat formed plastic elements (ABS - IMPAX 7000 - ALLAX SC)

Materials approved for repairs of elements made of IMPAX 7000 :

- Mixture : IMPAX powder + MEK (Methyl ethyl ketone) (TB 11-003),
- Reduce an IMPAX 7000 plate part (TB 24-900) to powder or spangle,
- Make this powder dissolve in mixture to obtain an unctuous paste.

Materials approved for repairs of elements made of ABS :

- Mixture : ABS powder + adhesive (TB 08-920) for heat formed plastic,
- Reduce an ABS plate part (TB 24-901) to powder or spangle,
- Make this powder dissolve in mixture to obtain an unctuous paste,
- Glass fabric (TB 23-900).

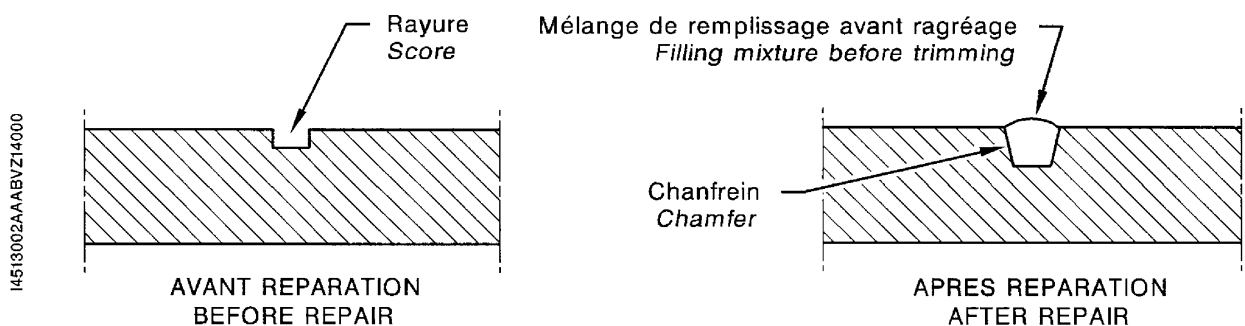
Materials approved for repairs of elements made of ALLAX SC :

- Mixture : ALLAX SC powder + MEK (Methyl ethyl ketone) (TB 11-003),
- Reduce an ALLAX SC plate part (TB 24-902) to powder or spangle,
- Make this powder dissolve in mixture to obtain an unctuous paste.

NOTE : It is possible to use polyurethane sealants to seal cracks. Previously, make sure these sealants stick correctly on ALLAX SC.

1) Defect 1 : score (groove in surface, of variable depth and length)

- Chamfer the score,
- Degrease with DIESTONE D (TB 11-912),
- Fill the score with the mixture,
- Allow to dry for 12 hours with ambient temperature,
- Deburr and sand with sandpaper (TB 05-916).



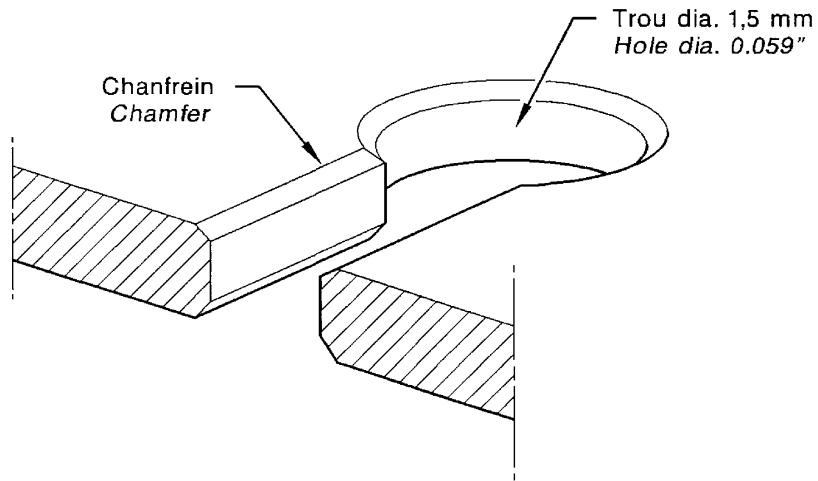
2) Defect 2 : crack and perforation

- Stop the crack by drilling both ends at dia. 1.5 mm (0.059")
- Make a chamfer - see sketch hereafter,
- Slightly sand the areas to glue with sandpaper,
- Degrease with DIESTONE D (TB 11-912),

AAAA

Validity : S / N 1 - 9999

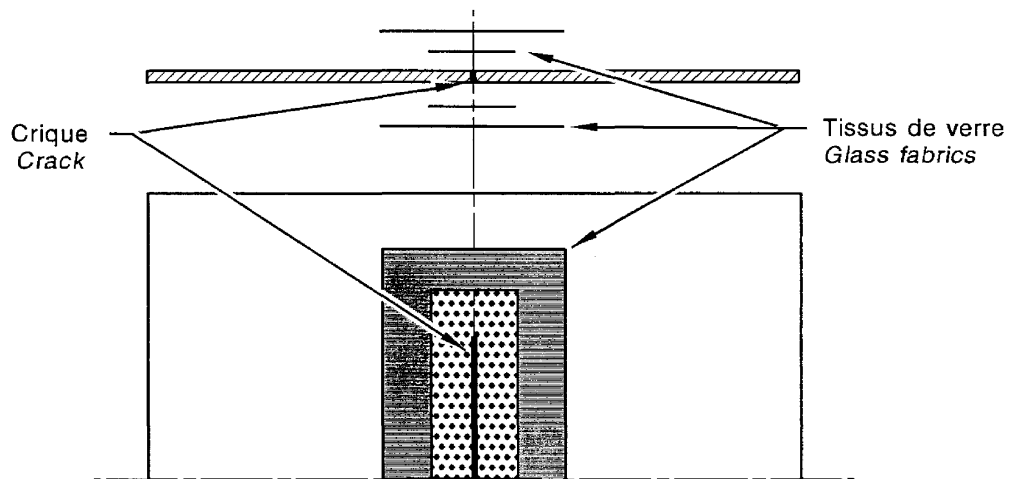
- Cut fabric (TB 23-900) - see depending on the case hereafter,
- Coat with the mixture,
- Apply the fabrics impregnated with mixture,
- Allow to dry for 12 hours with ambient temperature,
- Deburr and sand with sandpaper (TB 05-916).



14513002AAA BVZ14100

1st case : REPAIR ON BOTH FACES

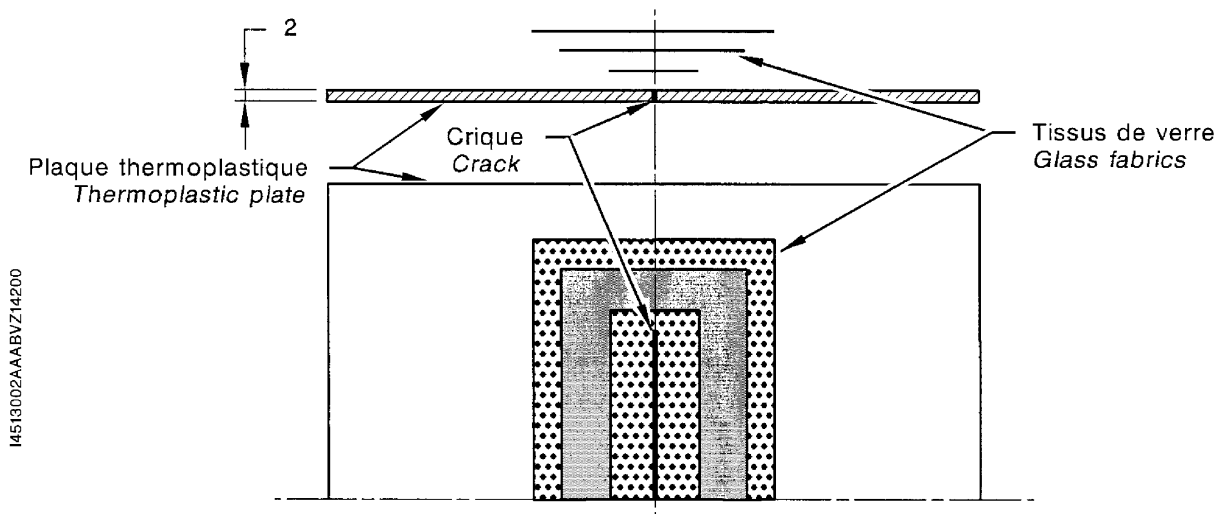
All thicknesses



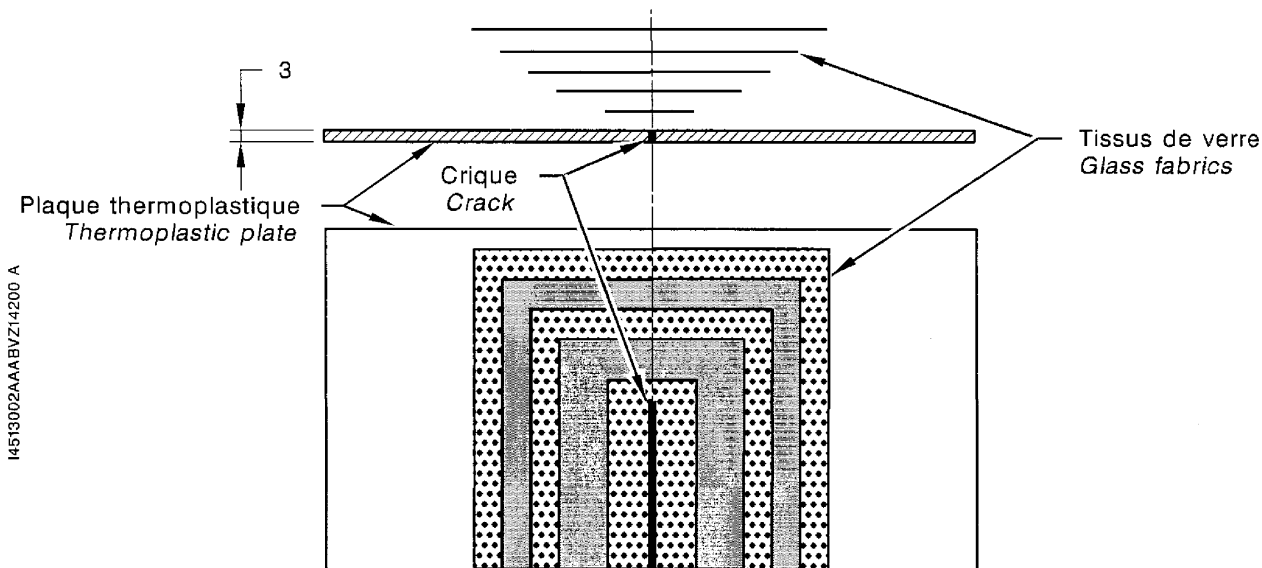
14513002AAA BVZ14100 A

2nd case : REPAIR ON ONE FACE

Thermoplastic plate, thickness 1 to 2 mm (0.039" to 0.079")



Thermoplastic plate, thickness 2 to 4 mm (0.079" to 0.157")



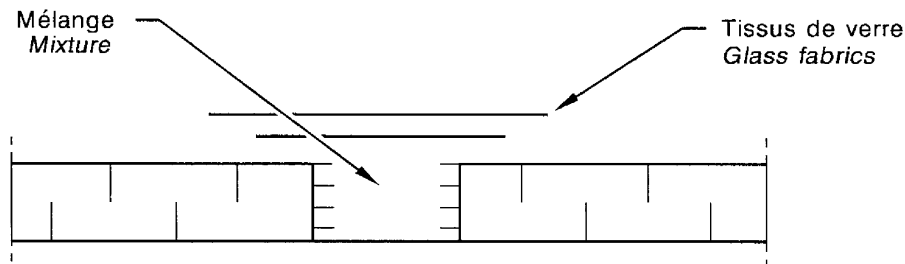
C. Honeycomb sandwich elements

Materials approved for repairs

- Epoxy resin (TB 08-909) + (TB 08-923) + (TB 08-924)
- Glass fabric (TB 23-900)
- Mixture : Epoxy resin + microballons (glass fabric microballons) including :
 - microballon powder (TB 05-057A)
 - ARALDITE 121N (TB 08-909)
 - ARALDITE AY 103 (TB 08-923)
 - HARDENER HY 951 (TB 08-924)

1) Defect 1 : Skin perforation with honeycomb core damage

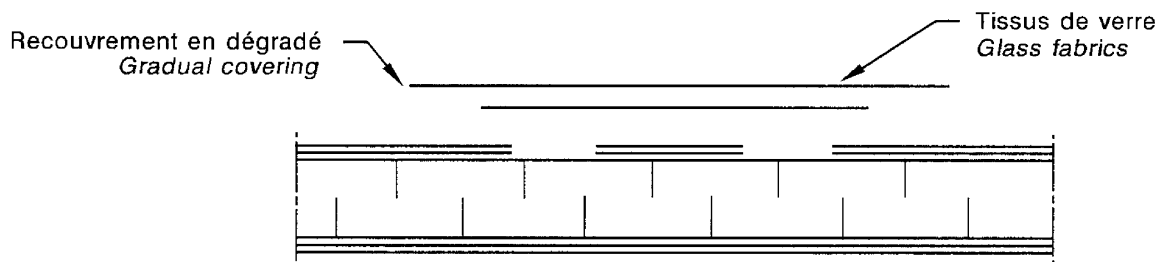
- Bore the defect area,
- Fill with the mixture,
- Restore the skin by stacking N* glass fabrics (TB 23-900) impregnated with resin (TB 08-909), after having sanded the covering area with sandpaper (TB 05-916),
- Deburr and sand with sandpaper (TB 05-916).



I4513002AAABVZ24000

2) Defect 2 : Blister or burning at the location of a recess

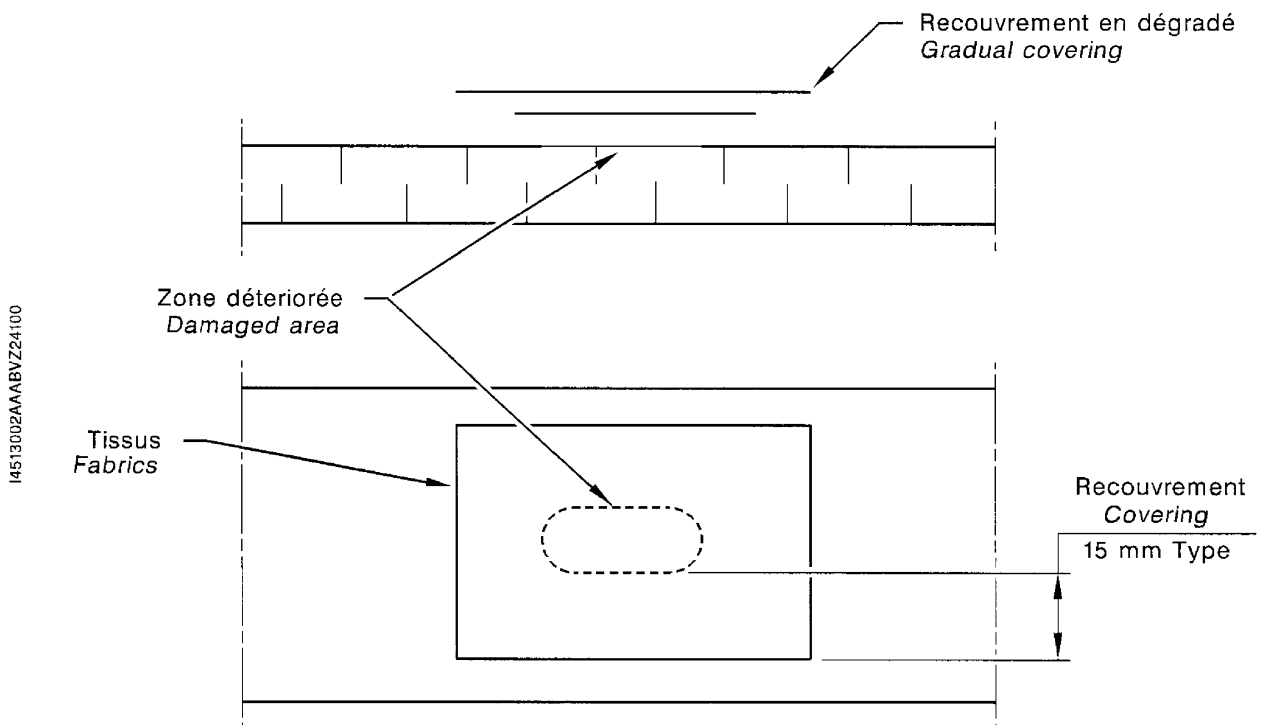
- Sand the surface where the blisters appear as well as the covering area with sandpaper (TB 05-916),
- Cover the sanded area with N* glass fabrics (TB 23-900) impregnated with resin (TB 08-909) + (TB 08-923) + (TB 08-924),
- Deburr and sand with sandpaper (TB 05-916).



I4513002AAABVZ24000 A

3) Defect 3 : Unsticking or burning of the skin

- Cut out the unstuck skin,
- Sand the covering area with sandpaper (TB 05-916),
- Restore the coating with N* glass fabrics (TB 23-900) impregnated with resin (TB 08-909) + (TB 08-923) + (TB 08-924),
- Deburr and sand with sandpaper (TB 05-916).



N* : from 1 to 4 depending on defect depth

PAGE INTENTIONALLY LEFT BLANK

FASTENERS

DESCRIPTION AND OPERATION

1. GENERAL

This chapter describes the various fastener types used in aircraft manufacturing. Almost all structure assembly is carried out with rivets of various types. Some structure elements and movable parts are assembled using screws and nuts.

COMPONENT	QTY	AREA	ACCESS DOOR	REFERENCE
Hardware (screws and bolts)	/	/	/	51-40-01
Rivets	/	/	/	51-40-02

PAGE INTENTIONALLY LEFT BLANK

HARDWARE (SCREWS AND BOLTS)

1. GENERAL

A. Drilling diameters

- 1) Standard hardware, nominal dia. : + 0.2 ;+ 0
- 2) Calibrated bolts, threaded bolts - f7 -, bore clearances H7 or H8.

B. Standard or currently used screws

DESCRIPTION	SOCATA P / N *	MATERIAL
Hex head screw :		
- without pin hole (H)	Z00.N5102	Stainless steel XC 18 or equivalent
- without pin hole	Z00.N5101	Steel 35NC6f T.S. = 880 MPa
- with pin hole	Z00.N5104	Steel 35NC6f T.S. = 880 MPa
Slot-headed screw :		
- 90° countersunk head (F / 90)	Z00.N5142	Steel XC 18 or equivalent
- wide cheese head (CL)	Z00.N5111	Steel XC 18 or equivalent
- «Poëliers» wide round head (RL)	Z00.N5169	Stainless steel
- «Poëliers» wide round head (RL) Phillips screw	Z00.N5169	Stainless steel

* SOCATA part numbers are intentionally incomplete. Only the first portion of the part number, giving the part type, is listed.

C. Hex head calibrated screws

DESCRIPTION	SOCATA P / N *	MATERIAL
- without pin hole, short thread	Z00.N5109	35NC6f steel T.S. = 880 MPa
- without pin hole	Z00.N5109	or
- with pin hole	Z00.N5109	30NCD16 steel T.S. = 1080 MPa

* SOCATA part numbers are intentionally incomplete. Only the first portion of the part number, giving the part type, is listed.

D. "Repair" sizes

As a rule, these screws allow 2 repair size possibilities without any thread modification.

R1 = dia. + 0.2

R1 = dia. + 0.5

Example : If a screw hole to be calibrated to 6 H8 dia. is elongated, counterdrill to 6.2 H8 or 6.5 H8 dia. depending on elongation and make a 6.2 h7 or 6.5 h7 dia. screw.

E. Standard nuts

DESCRIPTION	SOCATA P / N *	MATERIAL
Standard hexagonal nut (H)	Z00.N5303	A563e T.S. = 600 MPa
Thin hexagonal nut (Hm)	Z00.N5305	or equivalent
Castellated hexagonal nut	Z00.N5374	36NC6 steel
Castellated thin hexagonal nut	Z00.N5376	T.S. = 880 MPa

* SOCATA part numbers are intentionally incomplete. Only the first portion of the part number, giving the part type, is listed.

F. Self-locking nuts

DESCRIPTION	SOCATA P / N *	MATERIAL
Hexagonal (HFr) thick nut - SIMMONDS PA 106 -	Z00.N5402	35NC6f steel
Double anchor nut - SIMLOC SR 1009 M -	Z00.N5301	25CD4S steel
Simple anchor nut - SIMLOC SR 2009 M -	Z00.N5431	25CD4S steel

* SOCATA part numbers are intentionally incomplete. Only the first portion of the part number, giving the part type, is listed.

G. Special nuts

DESCRIPTION	SOCATA P / N *
Floating anchor nut	Z00.N5385
"RAPID NU" nut	Z00.N5386
Sheet metal nut	Z00.N5387

* SOCATA part numbers are intentionally incomplete. Only the first portion of the part number, giving the part type, is listed.

NOTA : For repair, sheet metal nuts Z00.N5387 should be replaced by anchor nuts of same diameter with simple or double tab (Z00.N5431 or Z00.N5421).

PAGE INTENTIONALLY LEFT BLANK

RIVETS

1. GENERAL

NOTE : Theoretically, the material remaining between the hole and the part edge(s) must have a minimum dimension of 1.5 time the hole diameter. After repair (drilling to the upper diameter) and in any case, this minimum dimension will be smaller to one time the new hole diameter. In areas that are likely to corrode, it is recommended to wet the rivets before installation (addition of sealing agent such as PR).

A. Solid rivets

To be used when access to both sides is possible.

DESCRIPTION	SOCATA P / N *	MATERIAL
Round flat head rivet	Z00.N5528	AU2G
100° countersunk rivet	Z00.N5548	AU2G
100° countersunk small head rivet (not available on sale) - used on wings	Z00.N5561	AU4G

* SOCATA part numbers are intentionally incomplete. Only the first portion of the part number, giving the part type, is listed. SOCATA and manufacturer part numbers must be indicated on the purchase order.

B. Blind rivets

To be used when access is possible to only one side.

DESCRIPTION	SOCATA P / N *	MATERIAL
Brazier head rivet «IMEX»	Z00.N5536	AG5
Countersunk head rivet «IMEX»	Z00.N5557	AG5
120° countersunk head rivet «POP» (2.4 dia.) TAPKBS	Z00.N5557	
"FERO"	Z00.N5529	
Countersunk head rivet «AVDEL MBC»	Z00.N5548	
Brazier head rivet «AVDEL MBC»	Z00.N5529	
"CHERRY MAX"		
"CHERRY LOCK"		
"HUCK"		
"CHERRY NUT-PLATE"		

* SOCATA part numbers are intentionally incomplete. Only the first portion of the part number, giving the part type, is listed. SOCATA and manufacturer part numbers must be indicated on the purchase order.

- NOTE** :
- "AVDEL MBC", "CHERRY MAX", "CHERRY LOCK", "HUCK" rivets may replace "IMEX" rivets according to the repairman's stock.
 - "FERO" rivets may be replaced but only after consulting SOCATA.
 - 120° countersunk "POP" rivets (2.4 dia) may be replaced by "CHERRY NUT-PLATE" rivets.

C. "AVDELOCK" rivets Z00.N5529 / Z00.N5675

If an AVDELOCK rivet is to be replaced, remove the ring using a chisel and replace the rivet by an appropriate screw, washer and nut.

D. Rivet sizes

1) Solid rivets

The diameters normally used are the following : 2.4 - 2.8 - 3.2 - 3.6 - 4 - 4.8.

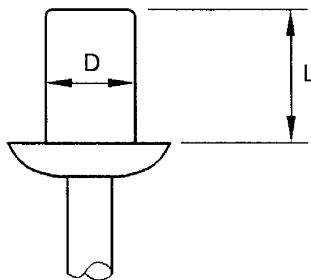
For repairs, it may be necessary to use rivets with repair sizes. So, it is advisable to provision rivets with larger diameters.

As the rivet length depends on the thicknesses of sheet metal to be riveted and on the rivet diameter, it is a practical method to use guillotine shears allowing quick and proper cutting of the rivets to the required length.

2) Blind rivets

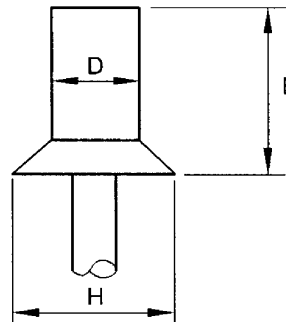
The diameters normally used are the following : 2.4 - 3.2 - 4 - 4.8.

Tête bombée "AD"
"AD" Brazier head rivet



SOCATA P / N Z00.N5536 *

Tête fraisée (120°) "AK"
"AK" Countersunk head rivet (120°)



SOCATA P / N Z00.N5557 *

"IMEX" TIGHT RIVETS

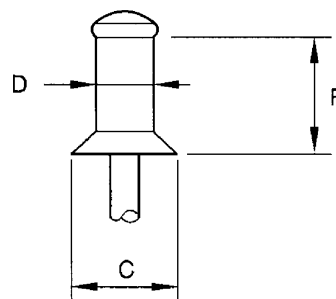
* SOCATA part numbers are intentionally incomplete. Only the first portion of the part number, giving the part type, is listed. SOCATA and manufacturer part numbers must be indicated on the purchase order.

I4514002AAAAYZ4000

D dia. (mm)	Drilling dia. (mm)	Grip range (mm)		Reference Nr (Manufacturer)	L (mm) (+0.4 ; -0.1)	F (mm) (+0.4 ; -0.1)	H (mm) ± 0.2
		"AD" brazier head	"AK" countersunk head				
3.2	3.3	0.5 to 1.5	1.5 to 2.5	AD or AK 42	5.9	6.8	6
		1.5 to 3	2.5 to 4	AD or AK 44	7.5	8.4	6
		3 to 5	4 to 6	AD or AK 46	9.1	10	6
		5 to 6.5	6 to 7.5	AD or AK 48	10.7	11.6	6
		6.5 to 8	7.5 to 9	AD or AK 410	12.3	13.2	6
4	4.1	1.5 to 3	2.5 to 4	AD or AK 54	7.9	9.2	7.9
		3 to 5	4 to 6	AD or AK 56	9.5	10.8	7.9
		5 to 6.5	6 to 7.5	AD or AK 58	11	12.3	7.9
		6.5 to 8	7.5 to 9	AD or AK 510	12.6	13.9	7.9
4.8	4.9	1.5 to 3	2.5 to 4	AD or AK 64	8.2	9.7	9.5
		3 to 5	4 to 6	AD or AK 66	9.8	11.3	9.5
		5 to 6.5	6 to 7.5	AD or AK 68	11.4	12.9	9.5
		6.5 to 8	7.5 to 9	AD or AK 610	13	14.5	9.5
		8 to 9.5	9 to 10.5	AD or AK 612	14.6	16.1	9.5

RIVET "POP" - Tête fraisée à 120°
"POP" RIVET - 120° countersunk head

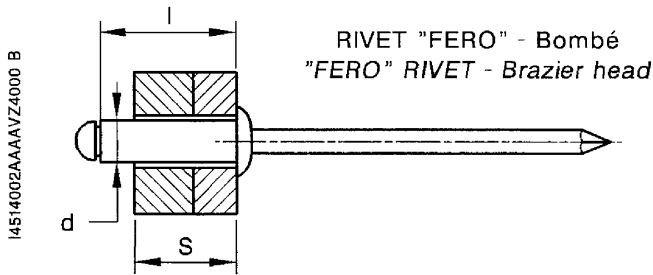
14514002AAAAVZ4000 A



SOCATA P / N Z00.N5557 *

NOTE : "POP" rivets should never be used for "structural" attachments.

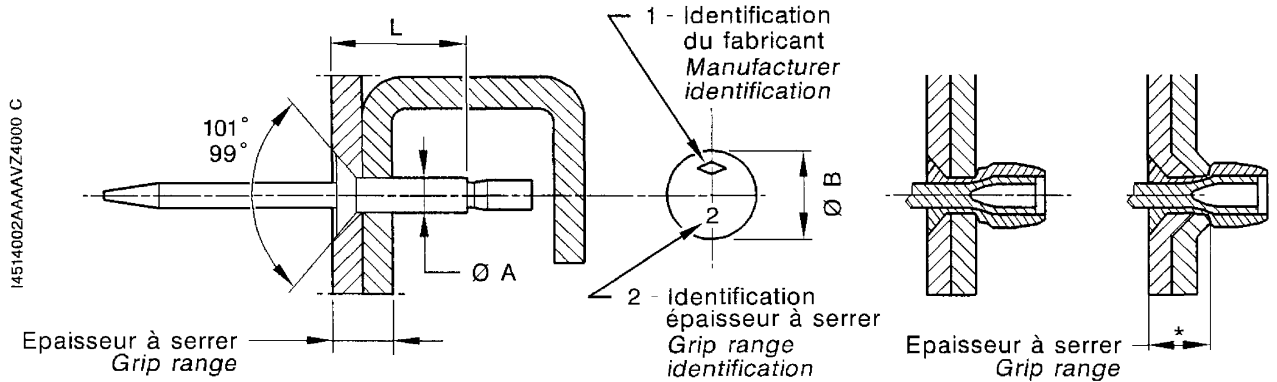
DESCRIPTION	Grip range (mm)	Reference Nr (Manufacturer)	D Dia. (mm)	F (mm) (+0.4 ; -0.1)	C (mm) ± 0.2
Pop Alu 2.4 x 5	1.1 to 3	TAP.K.320 BS	5.8	2.4	4.7
Pop Alu 2.4 x 7	3.1 to 5	TAP.K.329	8	2.4	4.7



SOCATA P / N Z00.N5529 *

d = 3.2 mm			d = 4.8 mm		
S Grip (mm)	I Rivet length (mm)	Reference Number	S Grip (mm)	I Rivet length (mm)	Reference Number
2.5 - 3.5	6.0	21306203060	1.0 - 2.5	6.5	21306205065
3.5 - 4.5	7.0	21306203070	2.5 - 3.5	7.5	21306205075
4.5 - 5.5	8.0	21306203080	3.5 - 4.5	8.5	21306205085
5.5 - 7.5	10.0	21306203100	4.5 - 5.5	9.5	21306205095
d = 4.0 mm			5.5 - 6.5	10.5	21306205105
S Grip (mm)	I Rivet length (mm)	Reference Number	6.5 - 7.5	11.5	21306205115
			7.5 - 9.5	13.5	21306205135
			9.5 - 10.5	15.5	21306205155
1.0 - 3.1	6.5	21306204065	10.5 - 12.5	17.5	21306205175
3.2 - 4.5	7.5	21306204075	12.5 - 14.5	19.5	21306205195
4.5 - 5.5	8.5	21306204085	14.5 - 16.5	21.5	21306205215
5.5 - 6.5	9.5	21306204095			
6.5 - 7.5	10.5	21306204105			
7.5 - 9.5	12.5	21306204125			

* SOCATA part numbers are intentionally incomplete. Only the first portion of the part number, giving the part type, is listed. SOCATA and manufacturer part numbers must be indicated on the purchase order.



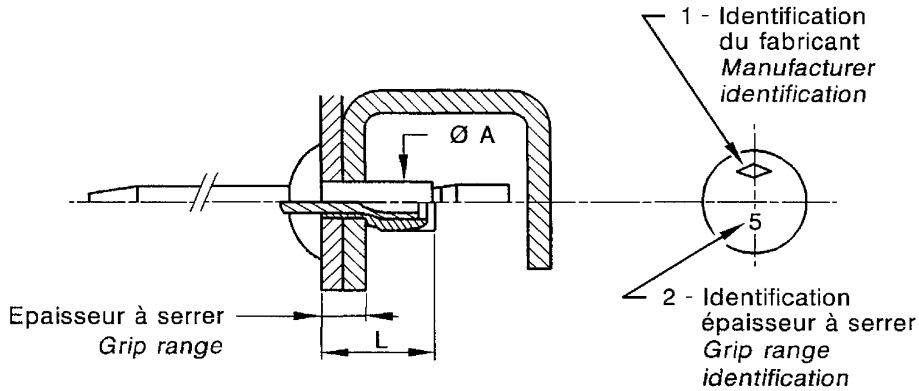
"AVDEL MBC" RIVET - 100° countersunk head, Series 4807
SOCATA P / N Z00. N5548 *

* Grip range to be considered
in case of riveting of
dimpled sheets.

A nominal dia. (mm)	B (mm)	Grip range (mm)		Rivet length L (mm)	AVDEL reference		
		Min.	Max.				
3.2	5.28	1.27	3.58	5.77	4807	-	0407
		2.77	5.16	7.34	4807	-	0409
		4.37	6.76	8.94	4807	-	0411
		5.94	8.33	10.52	4807	-	0413
		7.54	9.93	12.12	4807	-	0415
4	6.78	1.57	3.58	6.55	4807	-	0508
		2.77	5.16	8.13	4807	-	0510
		4.37	6.76	9.73	4807	-	0512
		5.94	8.33	11.30	4807	-	0514
		7.54	9.93	12.90	4807	-	0516
		9.12	11.51	14.48	4807	-	0518
4.8	8.36	10.72	13.11	16.08	4807	-	0520
		1.96	3.58	7.34	4807	-	0609
		2.77	5.16	8.94	4807	-	0611
		4.37	6.76	10.52	4807	-	0613
		5.94	8.33	12.12	4807	-	0615
		7.54	9.93	13.69	4807	-	0617
		9.12	11.51	15.29	4807	-	0619
10.72	13.11	16.87	4807	-	0621		

* SOCATA part numbers are intentionally incomplete. Only the first portion of the part number, giving the part type, is listed. SOCATA and manufacturer part numbers must be indicated on the purchase order.

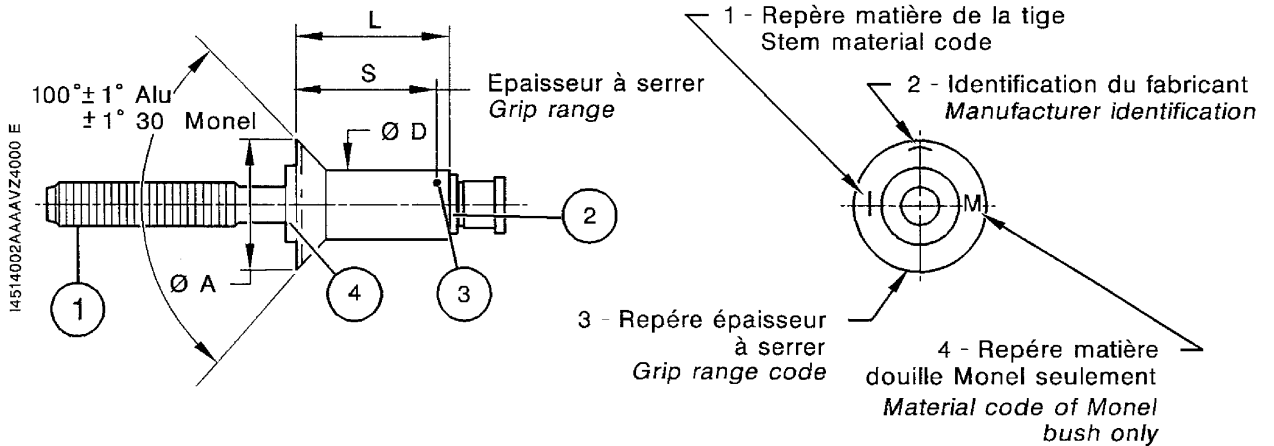
14514002AAAANZ4000 D



"AVDEL MBC" RIVET - Flat brazier head, Series 4801
SOCATA P / N Z00. N5529 *

A nominal dia. (mm)	Grip range (mm)		L (mm)	AVDEL reference		
	Min.	Max.				
3.2	0.51	1.98	4.67	4801	-	0405
	1.19	3.58	6.27	4801	-	0407
	2.77	5.16	7.85	4801	-	0409
	4.37	6.76	9.45	4801	-	0411
	5.94	8.33	11.02	4801	-	0413
	7.54	9.93	12.62	4801	-	0415
	4	0.51	1.98	5.52	4801	-
1.19		3.58	7.06	4801	-	0508
2.77		5.16	8.64	4801	-	0510
4.37		6.76	10.24	4801	-	0512
5.94		8.33	11.81	4801	-	0514
7.54		9.93	13.41	4801	-	0516
9.12		11.51	14.99	4801	-	0518
10.72		13.11	16.59	4801	-	0520
4.8	0.51	1.98	6.27	4801	-	0607
	1.19	3.58	7.85	4801	-	0609
	2.77	5.16	9.45	4801	-	0611
	4.37	6.76	11.02	4801	-	0613
	5.94	8.33	12.62	4801	-	0615
	7.54	9.93	14.20	4801	-	0617
	9.12	11.51	15.77	4801	-	0619
	10.72	13.11	17.17	4801	-	0621

* SOCATA part numbers are intentionally incomplete. Only the first portion of the part number, giving the part type, is listed. SOCATA and manufacturer part numbers must be indicated on the purchase order.



"CHERRY MAX" RIVET - 100° countersunk head, Type CR 3212
SOCATA P / N Z00. N5548 *

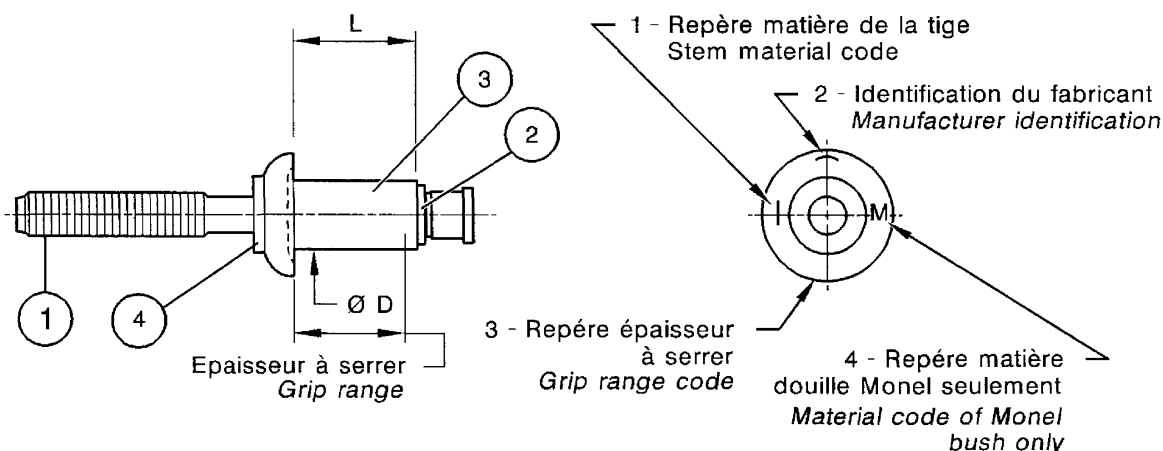
D dia. (mm)	A (mm)	Grip range (mm)		Rivet length (mm)	CHERRY MAX reference
		Min.	Max.		
3.2	5.72	1.60	3.18	5.69	CR 3212 - 4 - 2
		3.20	4.75	7.29	CR 3212 - 4 - 3
		4.78	6.35	8.86	CR 3212 - 4 - 4
		6.37	7.92	10.46	CR 3212 - 4 - 5
		7.95	9.52	12.04	CR 3212 - 4 - 6
		9.55	11.10	13.64	CR 3212 - 4 - 7
		11.13	12.70	15.21	CR 3212 - 4 - 8
		12.73	14.27	16.81	CR 3212 - 4 - 9
		4	7.27	1.65	3.18
3.20	4.75			7.44	CR 3212 - 5 - 3
4.78	6.35			9.02	CR 3212 - 5 - 4
6.37	7.92			10.62	CR 3212 - 5 - 5
7.95	9.52			12.19	CR 3212 - 5 - 6
9.55	11.10			13.79	CR 3212 - 5 - 7
11.13	12.70			15.37	CR 3212 - 5 - 8
12.73	14.27			16.97	CR 3212 - 5 - 9
14.30	15.88			18.54	CR 3212 - 5 - 10
15.90	17.45			20.14	CR 3212 - 5 - 11
4.8	8.97			2.03	3.18
		3.20	4.75	8.26	CR 3212 - 6 - 3
		4.78	6.35	9.83	CR 3212 - 6 - 4
		6.37	7.92	11.43	CR 3212 - 6 - 5
		7.95	9.52	13.00	CR 3212 - 6 - 6
		9.55	11.10	14.61	CR 3212 - 6 - 7
		11.13	12.70	16.18	CR 3212 - 6 - 8
		12.73	14.27	17.78	CR 3212 - 6 - 9
		14.30	15.88	19.35	CR 3212 - 6 - 10
		15.90	17.45	20.96	CR 3212 - 6 - 11
		17.48	19.05	22.53	CR 3212 - 6 - 12

* SOCATA part numbers are intentionally incomplete. Only the first portion of the part number, giving the part type, is listed. SOCATA and manufacturer part numbers must be indicated on the purchase order.

AAAA

Validity : S / N 1 - 9999

I4514002AAAAVZ4000 F



"CHERRY MAX" RIVET - Flat round head, Type CR 3213
SOCATA P / N Z00. N5521 *

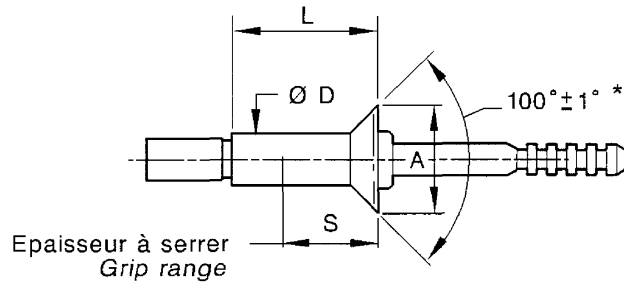
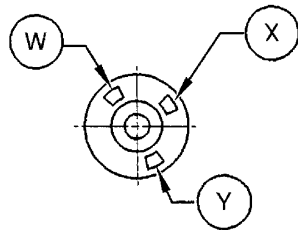
D nominal dia. (mm)	Grip range (mm)		Rivet length L (mm)	CHERRY MAX reference
	Min.	Max.		
3.2	0.63	1.57	4.08	CR 3213 - 4 - 1
	1.60	3.18	5.69	CR 3213 - 4 - 2
	3.20	4.75	7.29	CR 3213 - 4 - 3
	4.78	6.35	8.86	CR 3213 - 4 - 4
	6.37	7.92	10.46	CR 3213 - 4 - 5
	7.95	9.52	12.04	CR 3213 - 4 - 6
	9.55	11.10	13.64	CR 3213 - 4 - 7
	11.13	12.70	15.21	CR 3213 - 4 - 8
	12.73	14.27	16.81	CR 3213 - 4 - 9
4	0.78	1.57	4.75	CR 3213 - 5 - 1
	1.60	3.18	5.84	CR 3213 - 5 - 2
	3.20	4.75	7.44	CR 3213 - 5 - 3
	4.78	6.35	9.02	CR 3213 - 5 - 4
	6.37	7.92	10.62	CR 3213 - 5 - 5
	7.95	9.52	12.19	CR 3213 - 5 - 6
	9.55	11.10	13.79	CR 3213 - 5 - 7
	11.13	12.70	15.37	CR 3213 - 5 - 8
	12.73	14.27	16.97	CR 3213 - 5 - 9
	14.30	15.88	18.54	CR 3213 - 5 - 10
4.8	0.94	1.57	5.56	CR 3213 - 6 - 1
	1.60	3.18	6.65	CR 3213 - 6 - 2
	3.20	4.75	8.26	CR 3213 - 6 - 3
	4.78	6.35	9.83	CR 3213 - 6 - 4
	6.37	7.92	11.43	CR 3213 - 6 - 5
	7.95	9.52	13.00	CR 3213 - 6 - 6
	9.55	11.10	14.61	CR 3213 - 6 - 7
	11.13	12.70	16.18	CR 3213 - 6 - 8
	12.73	14.27	17.78	CR 3213 - 6 - 9
	14.30	15.88	19.35	CR 3213 - 6 - 10
	15.90	17.45	20.96	CR 3213 - 6 - 11
	17.48	19.05	22.53	CR 3213 - 6 - 12

* SOCATA part numbers are intentionally incomplete. Only the first portion of the part number, giving the part type, is listed. SOCATA and manufacturer part numbers must be indicated on the purchase order.

AAAA

Validity : S / N 1 - 9999

I4514002AAAAYZ4000 G



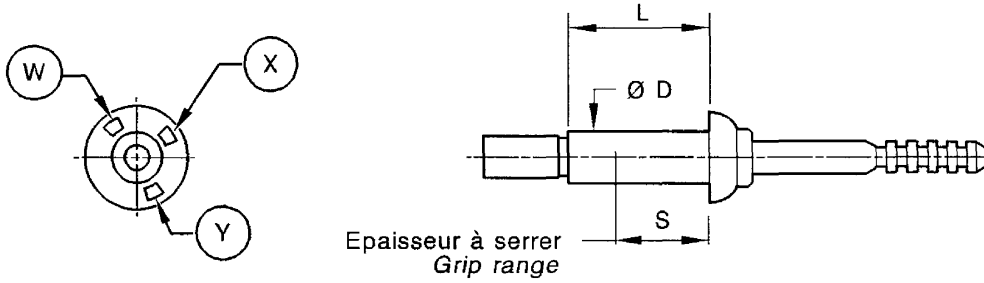
MARKING - Marking on rivet head includes :

- in W area, a letter defining material nature
 - . letter C for stainless steel
 - . letter M for MONEL alloy
 - . without any marking for aluminium alloy
- in X area, manufacturer initials (for example: letter T for CHERRY Cy)
- in Y area, the grip range code

100° countersunk head "CHERRY LOCK" rivet, type CR 2162

D dia. (mm)	A (mm)	Grip range (mm)		Rivet length L (mm)	CHERRY LOCK reference
		Min.	Max.		
3.2	5.72	1.60	3.17	6.35	CR 2162 - 4 - 2
		3.20	4.75	7.95	CR 2162 - 4 - 3
		4.78	6.35	9.52	CR 2162 - 4 - 4
		6.37	7.92	11.12	CR 2162 - 4 - 5
		7.95	9.52	12.70	CR 2162 - 4 - 6
4	7.26	1.65	3.17	6.35	CR 2162 - 5 - 2
		3.20	4.75	7.95	CR 2162 - 5 - 3
		4.78	6.35	9.52	CR 2162 - 5 - 4
		6.37	7.92	11.12	CR 2162 - 5 - 5
		7.95	9.52	12.70	CR 2162 - 5 - 6
		9.55	11.10	14.30	CR 2162 - 5 - 7
		11.13	12.70	15.88	CR 2162 - 5 - 8
4.8	8.97	2.03	3.17	6.35	CR 2162 - 6 - 2
		3.20	4.75	7.95	CR 2162 - 6 - 3
		4.78	6.35	9.52	CR 2162 - 6 - 4
		6.37	7.92	11.12	CR 2162 - 6 - 5
		7.95	9.52	12.70	CR 2162 - 6 - 6
		9.55	11.10	14.30	CR 2162 - 6 - 7
		11.13	12.70	15.88	CR 2162 - 6 - 8
		12.73	14.27	17.48	CR 2162 - 6 - 9
		14.30	15.88	19.05	CR 2162 - 6 - 10
		15.90	17.45	20.65	CR 2162 - 6 - 11
		17.48	19.05	22.22	CR 2162 - 6 - 12
6.35	12.09	3.20	4.75	9.52	CR 2162 - 8 - 3
		4.78	6.35	11.12	CR 2162 - 8 - 4
		6.37	7.92	12.70	CR 2162 - 8 - 5
		7.95	9.52	14.30	CR 2162 - 8 - 6
		9.55	11.10	15.88	CR 2162 - 8 - 7
		11.13	12.70	17.48	CR 2162 - 8 - 8
		12.73	14.27	19.05	CR 2162 - 8 - 9
		14.30	15.88	20.65	CR 2162 - 8 - 10
		15.90	17.45	22.22	CR 2162 - 8 - 11
		17.48	19.05	23.82	CR 2162 - 8 - 12
		19.08	20.62	25.40	CR 2162 - 8 - 13
		20.65	22.22	27.00	CR 2162 - 8 - 14

14514002AAAANVZ4000 H



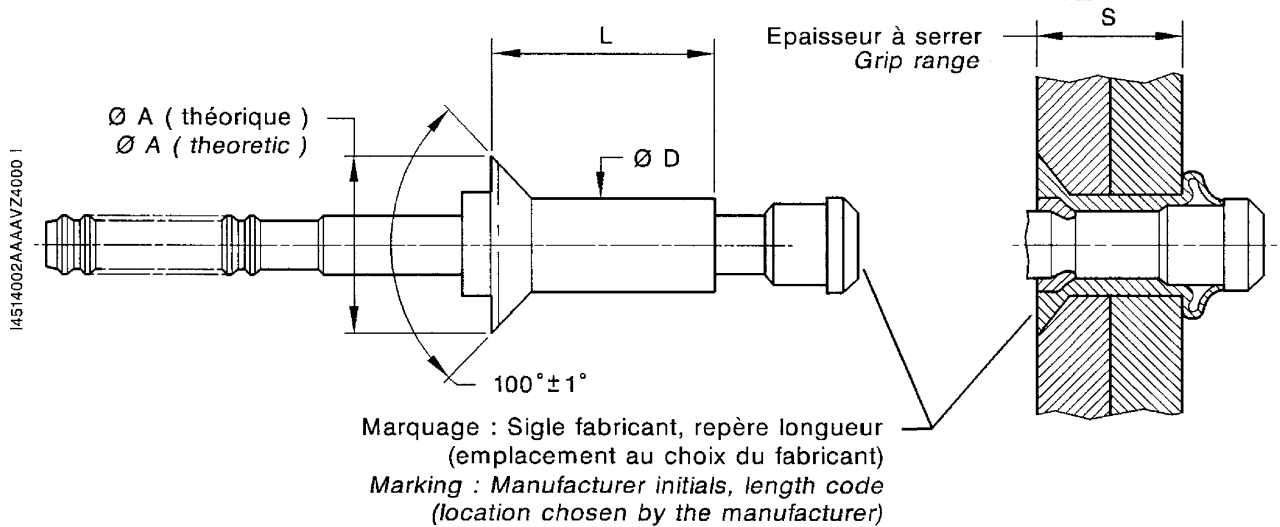
MARKING - Marking on rivet head includes :

- in W area, a letter defining material nature
 - . letter C for stainless steel
 - . letter M for MONEL alloy
 - . without any marking for aluminium alloy
- in X area, manufacturer initials (for example: letter T for CHERRY Cy)
- in Y area, the grip range code

Flat round head "CHERRY LOCK" rivet type CR 2163

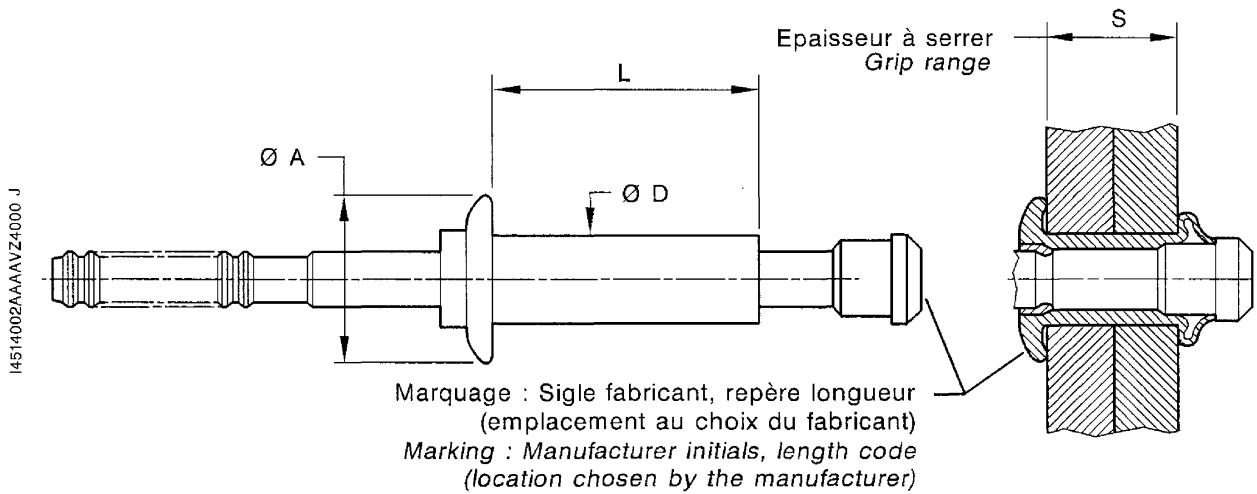
D dia. (mm)	Grip range (mm)		Rivet length L (mm)	CHERRY LOCK reference
	Min.	Max.		
3.2	0.64	1.57	4.78	CR 2163 - 4 - 1
	1.60	3.17	6.35	CR 2163 - 4 - 2
	3.20	4.75	7.95	CR 2163 - 4 - 3
	4.78	6.35	9.52	CR 2163 - 4 - 4
	6.38	7.92	11.12	CR 2163 - 4 - 5
	7.95	9.52	12.70	CR 2163 - 4 - 6
4	0.79	1.57	4.78	CR 2163 - 5 - 1
	1.60	3.17	6.35	CR 2163 - 5 - 2
	3.20	4.75	7.95	CR 2163 - 5 - 3
	4.78	6.35	9.52	CR 2163 - 5 - 4
	6.38	7.92	11.12	CR 2163 - 5 - 5
	7.95	9.52	12.70	CR 2163 - 5 - 6
	9.55	11.10	14.30	CR 2163 - 5 - 7
	11.13	12.70	15.88	CR 2163 - 5 - 8
4.8	0.94	1.57	4.78	CR 2163 - 6 - 1
	1.60	3.17	6.35	CR 2163 - 6 - 2
	3.20	4.75	7.95	CR 2163 - 6 - 3
	4.78	6.35	9.52	CR 2163 - 6 - 4
	6.38	7.92	11.12	CR 2163 - 6 - 5
	7.95	9.52	12.70	CR 2163 - 6 - 6
	9.55	11.10	14.30	CR 2163 - 6 - 7
	11.13	12.70	15.88	CR 2163 - 6 - 8
	12.73	14.27	17.48	CR 2163 - 6 - 9
	14.30	15.88	19.05	CR 2163 - 6 - 10
	15.90	17.45	20.65	CR 2163 - 6 - 11
	17.48	19.05	22.22	CR 2163 - 6 - 12

D dia. (mm)	Grip range (mm)		Rivet length L (mm)	CHERRY LOCK reference
	Min.	Max.		
6.35	1.60	3.17	7.95	CR 2163 - 8 - 2
	3.20	4.75	9.52	CR 2163 - 8 - 3
	4.78	6.35	11.12	CR 2163 - 8 - 4
	6.38	7.92	12.70	CR 2163 - 8 - 5
	7.95	9.52	14.30	CR 2163 - 8 - 6
	9.55	11.10	15.88	CR 2163 - 8 - 7
	11.13	12.70	17.48	CR 2163 - 8 - 8
	12.73	14.27	19.05	CR 2163 - 8 - 9
	14.30	15.88	20.65	CR 2163 - 8 - 10
	15.90	17.45	22.22	CR 2163 - 8 - 11
	17.48	19.05	23.82	CR 2163 - 8 - 12
	19.08	20.62	25.40	CR 2163 - 8 - 13
	20.65	22.22	27.00	CR 2163 - 8 - 14



100° countersunk head "HUCK" rivet, type NAS 1921B

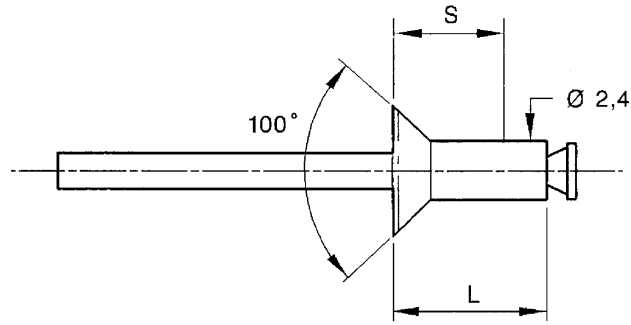
Ø D (mm)	A (mm)	Grip range (mm)		Rivet length L (mm)	HUCK reference
		Min.	Max.		
3.2	5.81	1.58	3.17	6.60	NAS 1921B - 04 - 02
		3.20	4.75	8.20	NAS 1921B - 04 - 03
		4.78	6.35	9.78	NAS 1921B - 04 - 04
		6.38	7.92	11.38	NAS 1921B - 04 - 05
		7.95	9.52	12.95	NAS 1921B - 04 - 06
4	7.36	2.03	3.17	6.68	NAS 1921B - 05 - 02
		3.20	4.75	8.28	NAS 1921B - 05 - 03
		4.78	6.35	9.85	NAS 1921B - 05 - 04
		6.38	7.92	11.45	NAS 1921B - 05 - 05
		7.95	9.52	13.03	NAS 1921B - 05 - 06
4.8	9.06	3.20	4.75	8.89	NAS 1921B - 06 - 03
		4.78	6.35	10.46	NAS 1921B - 06 - 04
		6.38	7.92	12.06	NAS 1921B - 06 - 05
		7.95	9.52	13.64	NAS 1921B - 06 - 06
		9.55	11.10	15.24	NAS 1921B - 06 - 07
		11.12	12.70	16.81	NAS 1921B - 06 - 08



Round head "HUCK" rivet, type NAS 1919B

D dia. (mm)	Grip range (mm)		Rivet length L (mm)	HUCK reference
	Min.	Max.		
3.2	0.64	1.57	5.03	NAS 1919B - 04 - 01
	1.58	3.17	6.60	NAS 1919B - 04 - 02
	3.20	4.75	8.20	NAS 1919B - 04 - 03
	4.78	6.35	9.78	NAS 1919B - 04 - 04
	6.38	7.92	11.38	NAS 1919B - 04 - 05
	7.95	9.52	12.95	NAS 1919B - 04 - 06
4.0	0.79	1.57	5.76	NAS 1919B - 05 - 01
	1.58	3.17	6.68	NAS 1919B - 05 - 02
	3.20	4.75	8.28	NAS 1919B - 05 - 03
	4.78	6.35	9.85	NAS 1919B - 05 - 04
	6.38	7.92	11.45	NAS 1919B - 05 - 05
	7.95	9.52	13.03	NAS 1919B - 05 - 06
4.8	0.94	1.57	6.37	NAS 1919B - 06 - 01
	1.58	3.17	7.29	NAS 1919B - 06 - 02
	3.20	4.75	8.89	NAS 1919B - 06 - 03
	4.78	6.35	10.46	NAS 1919B - 06 - 04
	6.38	7.92	12.06	NAS 1919B - 06 - 05
	7.95	9.52	13.64	NAS 1919B - 06 - 06
	9.55	11.10	15.24	NAS 1919B - 06 - 07
	11.12	12.70	16.81	NAS 1919B - 06 - 08

I4514002AAAAVZ4000 K



100° countersunk head 2.4 dia. "CHERRY NUT-PLATE" rivet, type CCR 264 SS

Grip range (mm)		Rivet length L (mm)	CHERRY NUT-PLATE reference
Min.	Max.		
-	1.57	3.55	CCR 264 SS - 3 - 1
1.60	3.17	5.15	CCR 264 SS - 3 - 2
3.20	4.75	6.73	CCR 264 SS - 3 - 3
4.77	6.35	8.33	CCR 264 SS - 3 - 4
6.37	7.92	9.90	CCR 264 SS - 3 - 5
7.95	9.52	11.50	CCR 264 SS - 3 - 6
9.55	11.12	13.08	CCR 264 SS - 3 - 7
11.15	12.70	14.68	CCR 264 SS - 3 - 8

E. Drilling diameters (for countersunk rivets, see Paragraph G.)

NOTE : Theoretically, the material remaining between the hole and the part edge(s) must have a minimum dimension of 1.5 time the hole diameter. After repair (drilling to the upper diameter) and in any case, this minimum dimension will be smaller to one time the new hole diameter).

- 1) Solid rivets
 - a) For standard thicknesses : nominal dia. +0.2 ; +0
 - b) For large thicknesses : nominal dia. +0.1 ; +0

The rivet should be a tight fit.

- 2) Blind rivets
Nominal dia. (+0,2 ; +0)

F. General advice for riveting (for countersunk rivets, see Paragraph G.)

- 1) Preparing for riveting

The main elements which determine riveting quality are the following :

- a) Drillings - see Paragraph E.
- b) Counterbore if necessary.
- c) Deburr and clean the rivet hole.
- d) Determine the rivet length.

Cutting to length of solid rivets should be made with an appropriate tool. The rivet should be cut at right angles. For solid rivets, the overlength of the unit to be riveted should be :

L = dia. + 0.7 mm up to 4 dia.

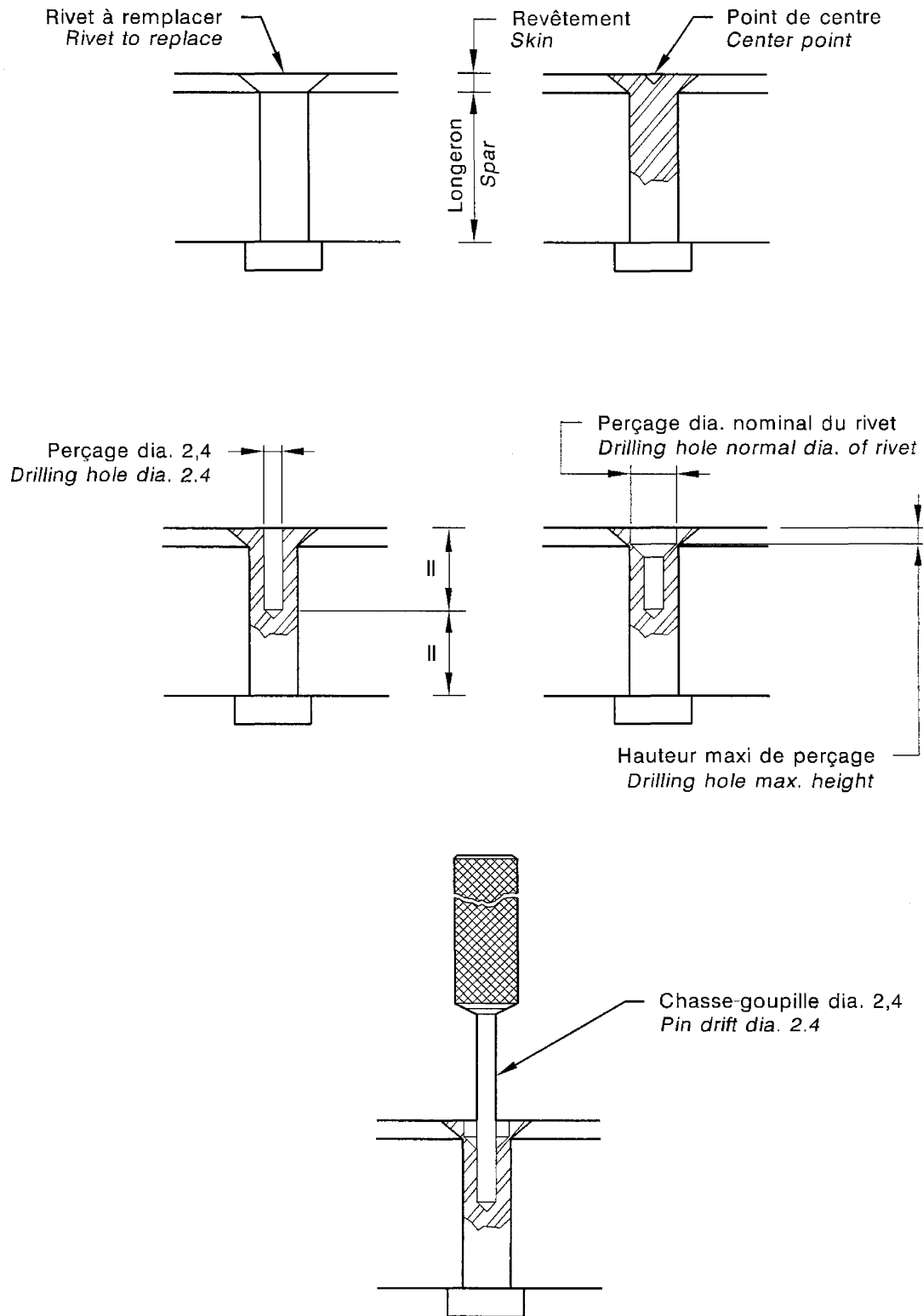
L = dia. + 1.2 mm from 5 to 8 dia.

- 2) Riveting with solid rivets
 - a) AU2G rivets are used without quenching.
 - b) AU4G rivets are used on freshly quenched parts.

G. Repair of countersunk and unsettled rivets (Figure 201)

- 1) Replace countersunk rivets in all areas except the wing spar
 - a) Rivet dia. 2.8 mm (0.110") TR F / 100 in sheet metal, thickness 0.8 mm (0.031").
Replace by rivet dia. 3.2 mm (0.126") TR F / 100. In theory, the head protrudes 0.4 mm (0.016").
 - b) Rivet dia. 3.2 mm (0.126") TR F / 100 in sheet metal, thickness 1 mm (0.039").
Replace by rivet dia. 3.6 mm (0.142") TR F / 100. In theory, the head protrudes 0.35 mm (0.014").
 - c) Rivet dia. 3.6 mm (0.142") TR F / 100 in sheet metal, thickness 1.2 mm (0.047").
Replace by rivet dia. 3.6 mm (0.142") F / 100. In theory, the head protrudes 0.2 mm (0.008").

- 2) Rivets on the wing spar
 - a) Ejection of existing rivets
 - Make a center point on the head of the rivet.
 - Using a drill, 2.4 mm (0.094") maximum, make a hole in the rivet at mid height.
 - Remove the head of the rivet with a drill having a diameter appropriate for the rivet.
 - Eject the rivet body with a pin drift inserted into the reduced diameter.
 - b) Riveting repair :
 - Drill a hole to the dimension of repair :
 - . dia. 3.2 mm (0.126") for 2.8 (0.110")
 - . dia. 3.6 mm (0.142") for 3.2 (0.126")
 - . dia. 4 mm (0.157") for 3.6 (0.142") (hole indicated for memory : L.H. rivets).
 - Clean the countersink.
 - Reset the rivets corresponding to their holes.
 - In the case of a sealed area, redo the tightness - see 28-10-00 Paragraph 6.



Repair method of rivets
Figure 201

14516000AAAAVZ24100

INVENTORY OF DAMAGE

1. GENERAL

This inventory is made in three steps :

- Visual inspection.
- Measurements.
- Triangulation and leveling.

2. VISUAL INSPECTION

All components likely to interfere are removed (cowlings, doors, etc...).

The inspection is carried out :

- On the damaged area.
- On surrounding areas, since a major impact having entailed damage to part of the structure may have consequential effects (transmitted through the structure itself) on adjacent components.
- On attachments of main components which will be inspected thoroughly.

3. MEASUREMENTS - TRIANGULATION - LEVELING

The purpose of complete measurements is to evidence the structural distortions which are not detected during visual inspection.

Measurement dimensions, triangulation and leveling points - see 51-50-01.

For location dimensions and deflection angles, refer to corresponding chapters of this manual.

In case the measurements show differences out of tolerances with respect to original sizes, the aircraft should be inspected by manufacturer specialists who will decide the necessity and place of repair (Flying Club, Service-Station, Manufacturer or scrap).

PAGE INTENTIONALLY LEFT BLANK

ALIGNMENT AND SYMMETRY

INSPECTION / CHECK

1. ALIGNMENT AND SYMMETRY CHECKS (Figures 601 and 602 and Tables 601 and 602)

A. Tools and consumable materials

- Steel tape decameter
- Plumb line
- Adhesive tape
- Transit
- Graduated sighting ruler

B. Location of check points

- Point (a) : Punch mark located at 0.08 in or 0.12 in (2 or 3 mm) below metal sheets junction, 0.24 in (6 mm) behind firewall and 4.72 in (120 mm) under RHF, R.H. side.
- Point (b) : Punch mark located at 0.08 in or 0.12 in (2 or 3 mm) below metal sheets junction, 0.24 in (6 mm) behind firewall and 4.72 in (120 mm) under RHF, L.H. side.
- Point (e) : Punch mark located at about 1.97 in (50 mm) above metal sheets junction, 0.24 in (6 mm) forward of frame C9 and 4.72 in (120 mm) under RHF, L.H. side.
- Point (f) : Punch mark located at about 1.97 in (50 mm) above metal sheets junction, 0.24 in (6 mm) forward of frame C9 and 4.72 in (120 mm) under RHF, R.H. side.

NOTE : A yellow arrow, located under points a, b, e and f, allows easier location.

- Point (g) : Last rivet attaching skin under R.H. wing spar.
- Point (h) : Last rivet attaching skin under L.H. wing spar.
- Point (j) : Rivet attaching horizontal stabilizer skin and stabilizer tip by the spar, R.H. side.
- Point (k) : Rivet attaching horizontal stabilizer skin and stabilizer tip by the spar, L.H. side.
- Point (m) : Trailing edge upper angle of rudder.
- Point (o) : Rivet located at about 2.36 in (60 mm) from R.H. wing leading edge attaching skin and end rib.
- Point (p) : Rivet located at about 2.36 in (60 mm) from L.H. wing leading edge attaching skin and end rib.
- Point (r) : Rivet attaching skin and stabilizer tip by the rear small spar, R.H. side.
- Point (s) : Rivet attaching skin and stabilizer tip by the rear small spar, L.H. side.
- Point (t) : Frame C9 axis.
- Point (x) : Intersection of jk axis and aircraft centerline.
- Point (x') : Intersection of firewall and aircraft centerline.

C. Procedure

- 1) Defuel tanks - refer to 12-11-02.
- 2) Make sure the wing flaps are retracted.
- 3) Park the aircraft on a flat and clean area.
- 4) Level the aircraft - refer to 08-10-00.
- 5) Level with the sight tube.
 - a) Position the sight tube in the aircraft centerline at 118.11 in (3 m) as a minimum from the tail cone.
 - b) Adjust the sight tube in horizontal position.
 - c) Sight to points a, b, e and f.
 - d) Check that points b, e and f are at ± 0.01 in (0.3 mm) with respect to point a.

NOTE : During sighting operations, make sure the sighting ruler is perfectly vertical and the horizontal pointed end is correctly centered in the punch mark.

- 6) Set the elevator to neutral position $0^\circ (+ 10', - 20')$ - refer to 27-30-00.
- 7) Perform the symmetry check.
 - a) Symmetry conditions for the wings.
 - Incidence conditions $3^\circ (+ 30', - 15')$.
 - Twisting conditions $\pm 15'$ at the tip.
 - Symmetry conditions 0.78 in (20 mm) level difference between wing tips.
 - b) Symmetry conditions for the horizontal stabilizer.
 - Incidence conditions $0^\circ (+ 10', - 20')$.
 - Twisting conditions $\pm 15'$ between tips.
 - Symmetry conditions 0.78 in (20 mm) level difference between horizontal stabilizer tips.

CAUTION : ANY DIFFERENCES IN CORRESPONDING MEASUREMENTS BETWEEN THE L.H. AND R.H. WINGS MUST BE OF THE SAME SIGN.

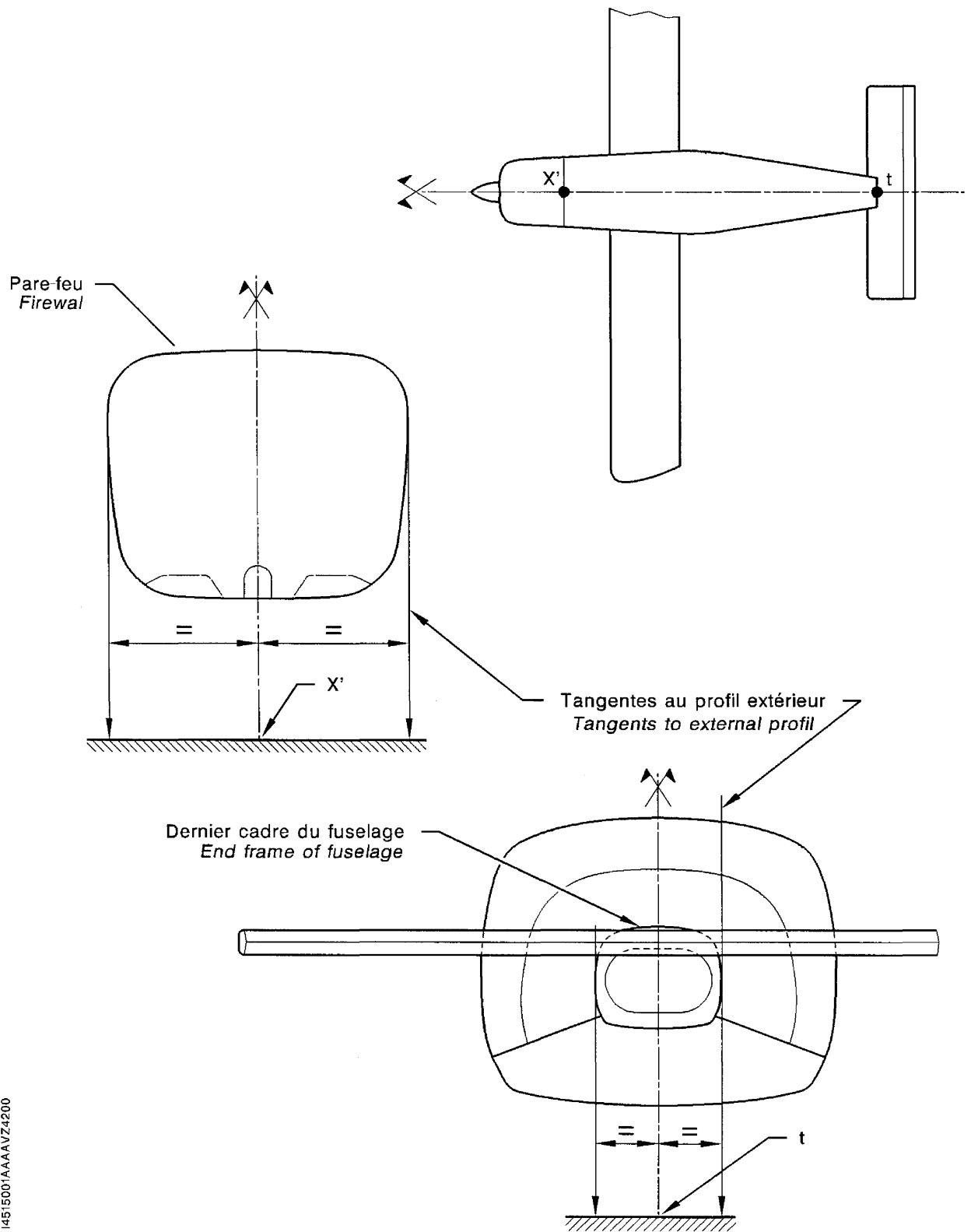
- c) Perform and record the measurements on Table 602.

NOTE : Measurements are taken under rivet heads.

- 8) Perform the alignment check.
 - a) Determine points t and x' on the ground and draw the aircraft centerline - see Figure 601.
 - b) Using a plumb line, project and mark points g, h, j and k on the ground.
 - c) Draw gh and jk axes and mark point x.
 - d) Perform and record the measurements on Table 601.
- 9) Remove the sight tube.
- 10) Lower the aircraft to ground and remove the jacks - refer to 07-10-00.
- 11) Make sure all the tools and materials are removed and the work area is clean and free from debris.
- 12) If necessary, refuel tanks - refer to 12-11-01.

AAAA

Validity : S / N 1 - 9999



Alignment and symmetry - Inspection / Check
Figure 601

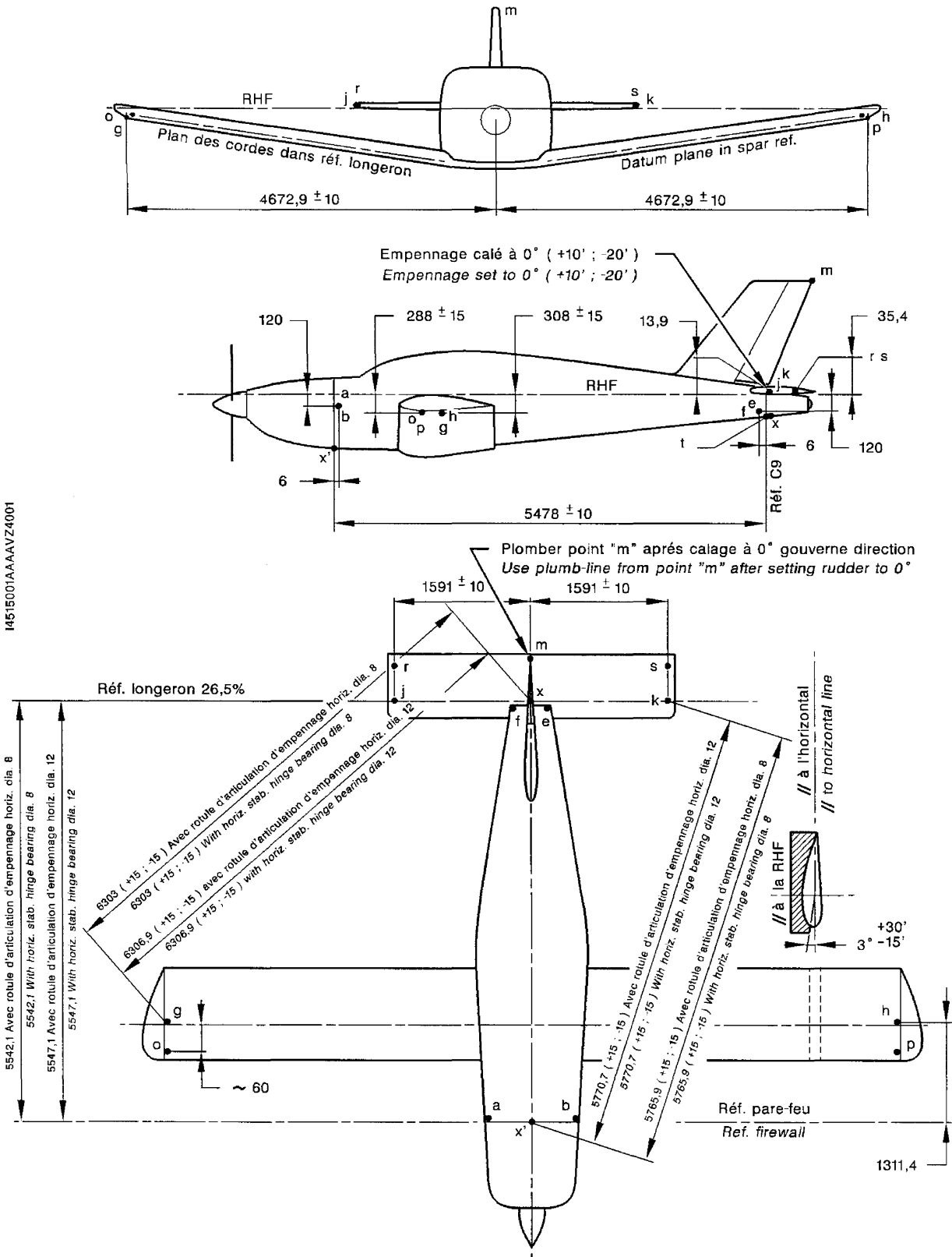
14515001AAAAVZ4200

AAAA
Validity : S / N 1 - 9999

51-50-01

(BA)

Page 603
OCT 02



14515001AAAAVZ4001

Alignment and symmetry - Inspection / Check
Figure 602

AAAA
Validity : S / N 1 - 9999

Measurement point mark, R.H. side	Measured dimension	THEORETICAL DIMENSION				Measured dimension	Measurement point mark, L.H. side
		NOMINAL		TOLERANCE			
		(mm)	(in)	(mm)	(in)		
x.g		6306.9 (1)	248.3	± 15	± 0.59	x.h	
		6303 (2)	248.15				
x'.j		5770.7 (1)	227.19	± 15	± 0.59	x'.k	
		5765.9 (2)	227				
(x, x').g		4672.9	183.97	± 10	± 0.4	(x, x').h	
x.j		1591	62.6	± 10	± 0.4	x.k	
x'.t		5478	215.67	± 10	± 0.4	/	

(1) Aircraft equipped with horizontal stabilizer hinge ball-joints diameter 12.

(2) Aircraft equipped with horizontal stabilizer hinge ball-joints diameter 8.

Alignment and symmetry - Inspection / Check
Table 601

DISTANCE OF THE SYMMETRY POINTS FROM THE FUSELAGE HORIZONTAL DATUM LINE							
Mark	Measured dimension	THEORETICAL DIMENSION				Measured dimension	Mark
		NOMINAL		TOLERANCE			
		(mm)	(in)	(mm)	(in)		
Fuselage frame C0				Fuselage frame C9			
a		120	4.72	± 0.3	± 0.01		e
b		120	4.72	± 0.3	± 0.01		f
R.H. wing				L.H. wing			
o		288	11.34	± 15	± 0.59		p
g		308	12.13	± 15	± 0.59		h
R.H. horizontal stabilizer				L.H. horizontal stabilizer			
j		13.9	0.55	± 10	± 0.39		k
r		35.4	1.39	± 10	± 0.39		s

Alignment and symmetry - Inspection / Check
Table 602

AAAA

Validity : S / N 1 - 9999

51-50-01

(BA)

Page 605
OCT 02

PAGE INTENTIONALLY LEFT BLANK

BALANCING OF CONTROL SURFACES

INSPECTION / CHECK

NOTE : In case of repair, painting or addition of optional equipment on control surfaces, make sure that the control surface weights remain within the authorized balancing limits. Otherwise, consult the manufacturer.

1. CHECK OF CONTROL SURFACE BALANCING

A. Tools and consumable materials (Figure 601)

- Bench
- Precision scale
- Balancing posts (to be fabricated)
- Aileron template (to be fabricated)
- Rudder template (to be fabricated)
- Elevator template (to be fabricated)
- Holding block (to be fabricated)

B. Preliminary steps

- 1) Perform the balancing check in a draught-free enclosed area.
- 2) Balancing check must be performed with the control surfaces in the same configuration as on the aircraft, i.e. painted, equipped with the tabs and free from foreign matter.
- 3) If a control surface is to be repainted, strip the former paint. If painting operation is properly made, the control surface will remain within the required balancing limits.
- 4) Install the balancing posts on a horizontal and flat bench. The posts should be at 90° with respect to the hinge bolt axis.
- 5) If necessary, equip the control surface with its hinge bolts.

C. Aileron balancing check procedure (Figure 602)

- 1) Install aileron template (1) on scale (2), then zero the scale.
- 2) Install aileron (3) on balancing posts (4), the aileron resting on the hinge bolts (two operators are required).
- 3) Position the aileron trailing edge on aileron template (1).
- 4) Measure the distance between the hinge axis and aileron template (1) (horizontal chord). It must be equal to 10.39 in (264 mm). Adjust aileron template (1) position if necessary.
- 5) Perform the weighing (Δm) and calculate the balance moment which must be :
 - Aileron M^t (in.lbs) = 10.39 (in) x Δm (lbs)
 - Aileron M^t (mm.kg) = 264 (mm) x Δm (kg)

- 6) Check that the value of the balance moment is within the permissible tolerances.

CONTROL SURFACE	BALANCE MOMENT			
	Min.		Max.	
	mm.kg	in.lbs	mm.kg	in.lbs
Aileron	85	7.37	110	9.54

- 7) Re-adjust the aileron balancing if necessary - refer to Paragraph 2.

D. Elevator balancing check procedure (Figure 603)

- 1) Install elevator template (1), tab lever bolt (7) and tab holding block (5) on scale (2), then zero the scale.
- 2) Install elevator (3) on balancing posts (4), the elevator resting on its hinge bolts (two operators are required).
- 3) Position the elevator trailing edge on elevator template (1).
- 4) Install tab lever bolt (7) and install tab holding block (5).
- 5) Measure the distance between the hinge axis and elevator template (1) (horizontal chord). It must be equal to 15.75 in (400 mm). Adjust elevator template (1) position if necessary.
- 6) Perform the weighing (Δm) and calculate the balance moment which must be :
 - Elevator M^t (in.lbs) = 15.75 (in) x Δm (lbs)
 - Elevator M^t (mm.kg) = 400 (mm) x Δm (kg)
- 7) Check that the value of the balance moment is within the permissible tolerances.

CONTROL SURFACE	BALANCE MOMENT			
	Min.		Max.	
	mm.kg	in.lbs	mm.kg	in.lbs
Elevator	0	0	250	21.7

- 8) Re-adjust the elevator balancing if necessary - refer to Paragraph 2.

E. Rudder balancing check procedure (Figure 604)

- 1) Install rudder template (1) on scale (2), then zero the scale.
- 2) Install rudder (3) on balancing posts (4), the rudder resting on its hinge pins (two operators are required).
- 3) Position the rudder trailing edge on rudder template (1).
- 4) Measure the distance between the hinge axis and rudder template (1) (horizontal chord). It must be equal to 11.81 in (300 mm). Adjust rudder template (1) position if necessary.
- 5) Perform the weighing (Δm) and calculate the balance moment which must be :
 - Rudder M^t (in.lbs) = 11.81 (in) x Δm (lbs)
 - Rudder M^t (mm.kg) = 300 (mm) x Δm (kg)

- 6) Check that the value of the balance moment is within the permissible tolerances.

CONTROL SURFACE	BALANCE MOMENT			
	Min.		Max.	
	mm.kg	in.lbs	mm.kg	in.lbs
Rudder	230	19.95	300	26

- 7) Re-adjust the rudder balancing if necessary - refer to Paragraph 2.

2. BALANCING RE-ADJUSTMENT (Figures 605, 606 and 607)

NOTE : In case of unsatisfactorily-balanced control surface, first check if unbalance can be attributed to a nonconforming repair or painting. It is possible to re-adjust balancing to a small extent.

A. Tools and consumable materials

None

B. Elevator balancing re-adjustment procedure

- 1) Invert the balance weight to increase the balance moment - refer to Figure 605.

CAUTION : DO NOT EXCEED THE MINIMUM VALUE OF BALANCE WEIGHT - REFER TO 55-20-00.

- 2) Drill holes (3 maximum) or remove material from the balance weight to increase the balance moment - refer to Figure 606.

NOTE : Make sure enough material remains between the attachment holes and the lightening holes - minimum 0.31 in (8 mm).

NOTE : A drilling depth of 0.4 in (10 mm) with a drill dia. # X (10 mm) corresponds to a weight loss of 0.02 lbs (9 g).

CAUTION : DO NOT EXCEED THE MAXIMUM VALUE OF BALANCE WEIGHT - REFER TO 55-20-00.

- 3) If necessary, add a steel washer to the balance weight to reduce the balance moment - refer to Figure 607.

NOTE : Make sure the attachment bolts are long enough after addition of the washer. If they have to be replaced - refer to the Illustrated Parts Catalog.

- 4) Make sure balancing is correct - refer to Paragraph 1.

C. Rudder balancing re-adjustment procedure

CAUTION : DO NOT EXCEED THE MINIMUM VALUE OF BALANCE WEIGHT - REFER TO 55-40-00.

- 1) Drill holes or remove material from the balance weight to increase the balance moment - refer to Figure 606.

NOTE : Make sure enough material remains between the attachment holes and the lightening holes - minimum 0.31 in (8 mm).

NOTE : A drilling depth of 0.4 in (10 mm) with a drill dia. # X (10 mm) corresponds to a weight loss of 0.02 lbs (9 g).

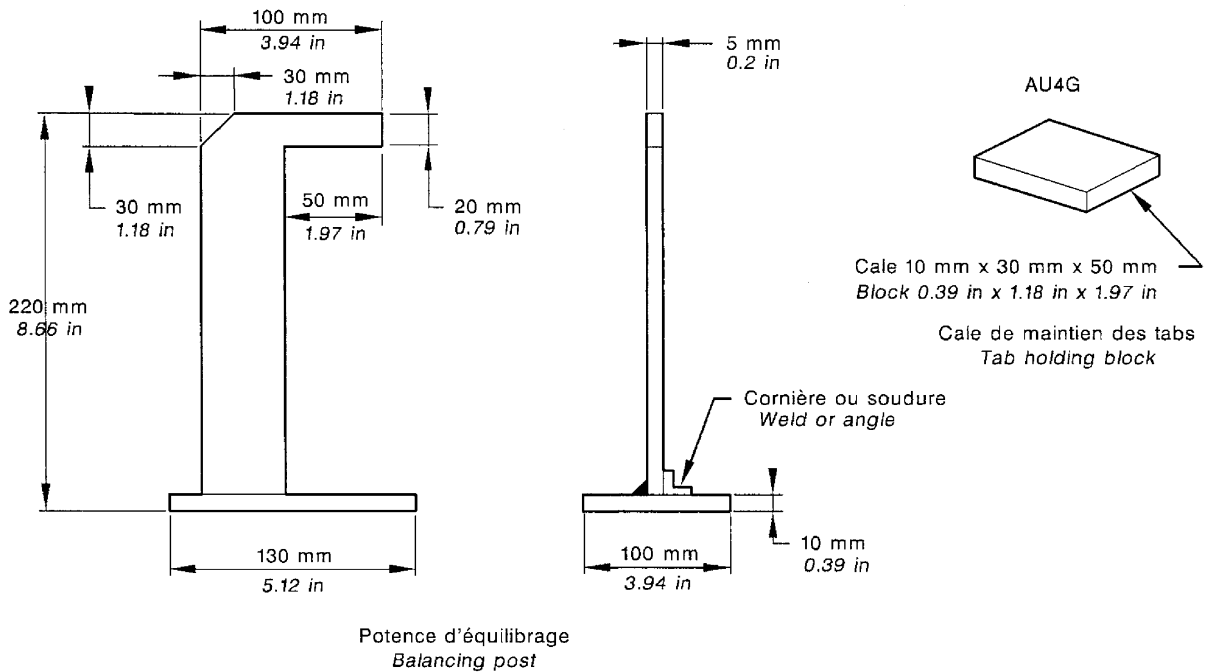
AAAA

Validity : S / N 1 - 9999

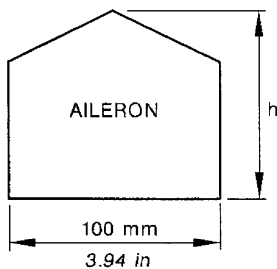
- 2) Make sure balancing is correct - refer to Paragraph 1.

D. Aileron balancing re-adjustment procedure

- 1) Apply a coat of paint on the leading edge (forward of the hinge axis) to reduce the balance moment.
- 2) Apply a coat of paint on the section aft of the hinge axis to increase the balance moment.
- 3) Make sure balancing is correct - refer to Paragraph 1.

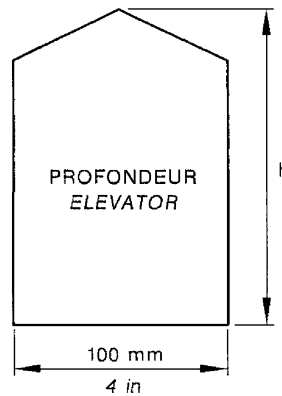


AU4G ép. : 1,6 mm
AU4G thick. : 0.06 in



$h = 137 \text{ mm}$ moins la hauteur de la balance
 $h = 5.39 \text{ in}$ minus scale height

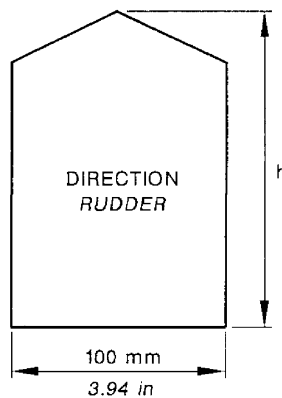
Gabarit d'aileron
Aileron template



AU4G ép. : 1,6 mm
AU4G thick. : 0.06 in

TB9 - TB10 - TB200
 $h = 235 \text{ mm}$ moins la hauteur de la balance
pour axe d'articulation empennage dia. 8 mm
 $h = 237 \text{ mm}$ moins la hauteur de la balance
pour axe d'articulation empennage dia. 12 mm
 $h = 9.25 \text{ in}$ minus scale height for stabilizer
hinge pin dia. 0.31 in
 $h = 9.33 \text{ in}$ minus scale height for stabilizer
hinge pin dia. 0.47 in

Gabarit de gouverne de profondeur
Elevator template



AU4G ép. : 1,6 mm
AU4G thick. : 0.06 in

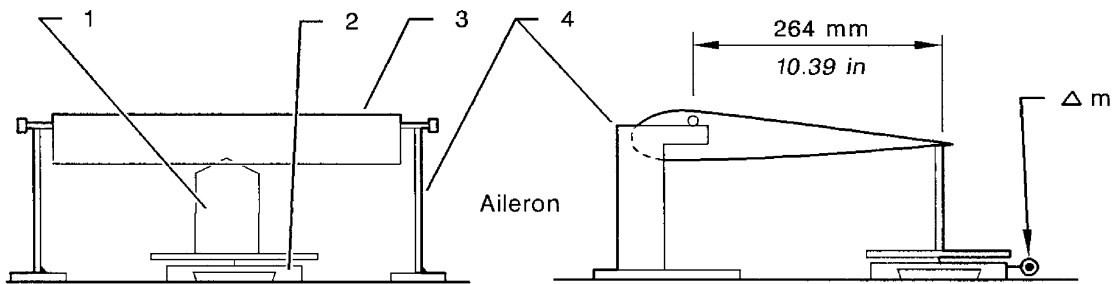
$h = 218 \text{ mm}$ moins la hauteur de la balance
 $h = 8.58 \text{ in}$ minus scale height

Gabarit de gouverne de direction
Rudder template

14516000AAAHVZ4000

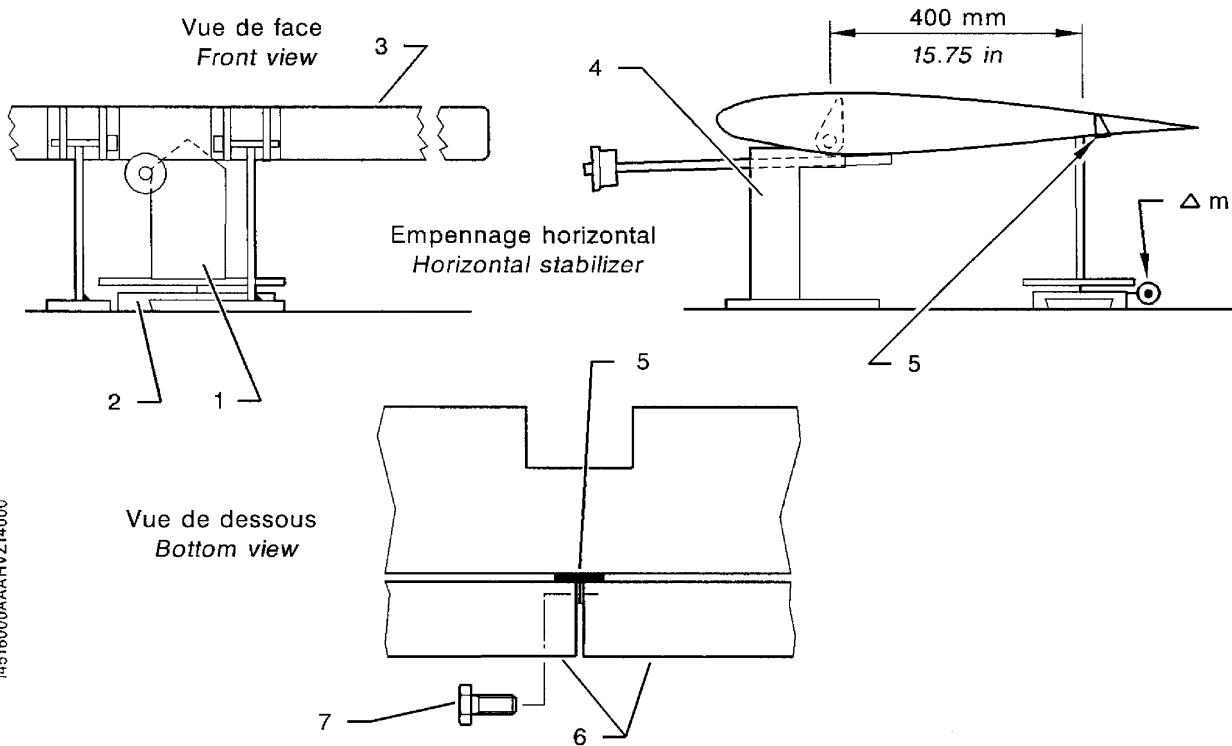
Tools - Balancing check
Figure 601

- 1 - Aileron template
- 2 - Scale
- 3 - Aileron
- 4 - Balancing post



Aileron - Balancing check
Figure 602

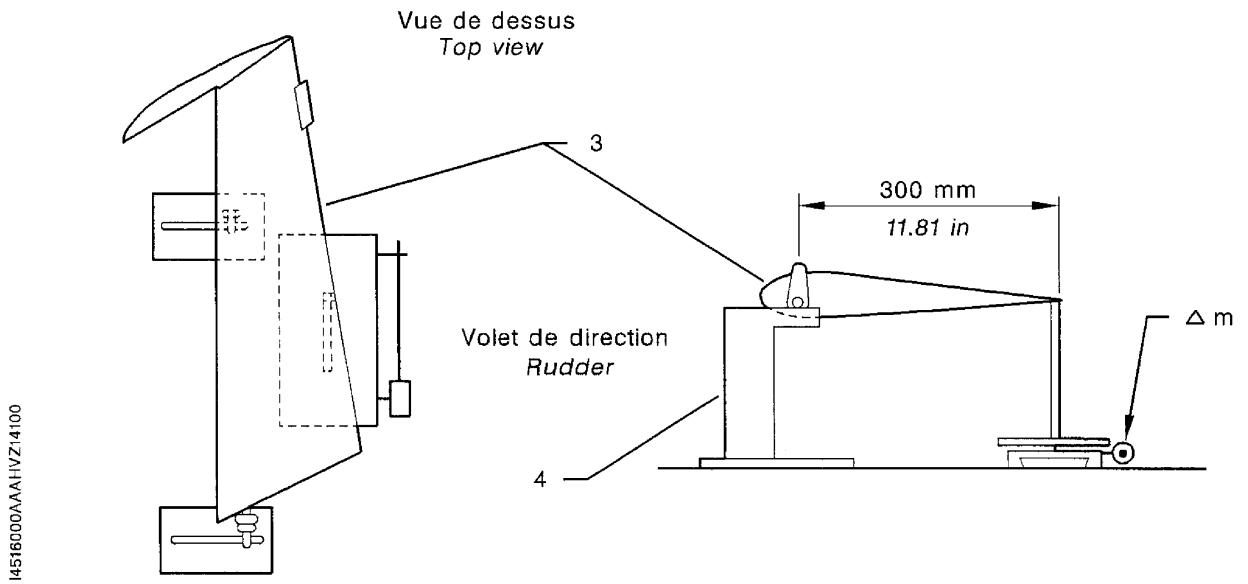
- 1 - Elevator template
- 2 - Scale
- 3 - Elevator
- 4 - Balancing post
- 5 - Tab holding block
- 6 - Tab
- 7 - Tab lever bolt



Elevator - Balancing check
Figure 603

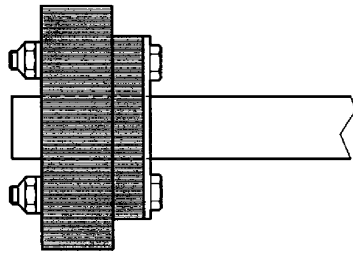
14516000AAA HVZ14000

- 1 - Rudder template
- 2 - Scale
- 3 - Rudder
- 4 - Balancing post

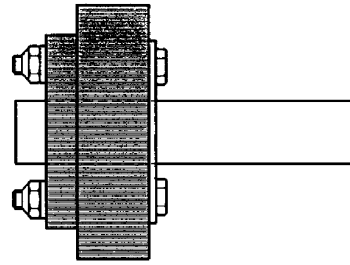


Rudder - Balancing check
Figure 604

14516000AAAAVZ4100



Masse d'équilibrage position série
Balance weight - serial position



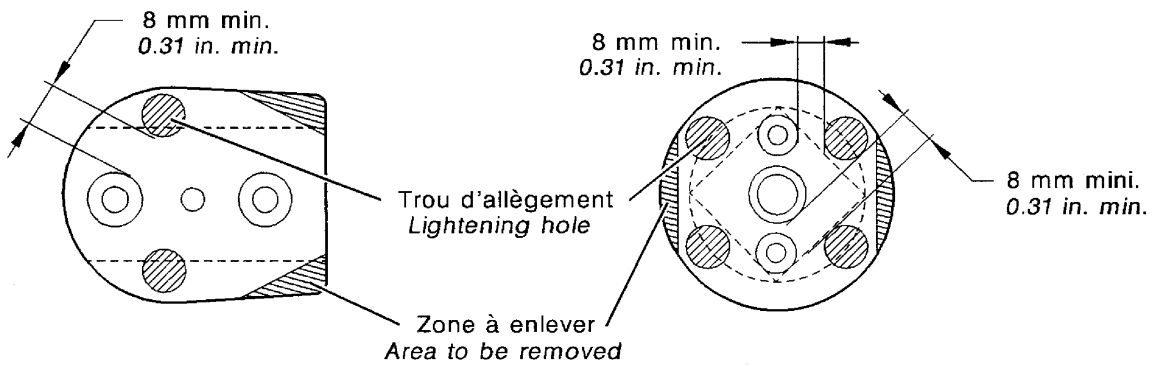
Masse d'équilibrage après retournement
Balance weight after reversal

Balance weight
Figure 605

Masse empennage vertical (vue de dessus)
Vertical stabilizer balance weight (top view)

Masse empennage horizontal (vue de l'avant)
Horizontal stabilizer balance weight (front view)

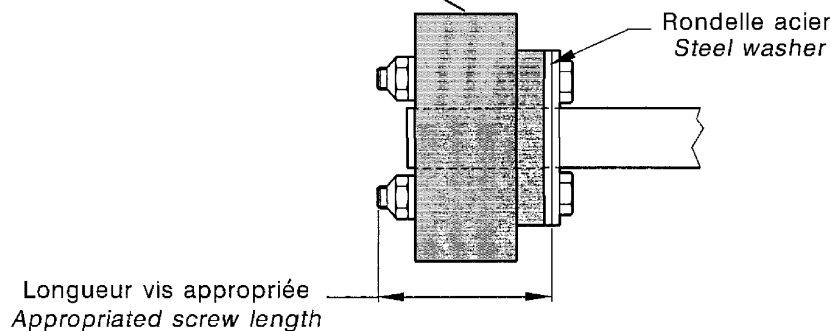
14516000AAAAVZ4100 A



Stabilizers weight
Figure 606

Masse empennage horizontal
Horizontal stabilizer balance weight

14516000AAAAVZ4101 B



Stabilizers weight
Figure 607