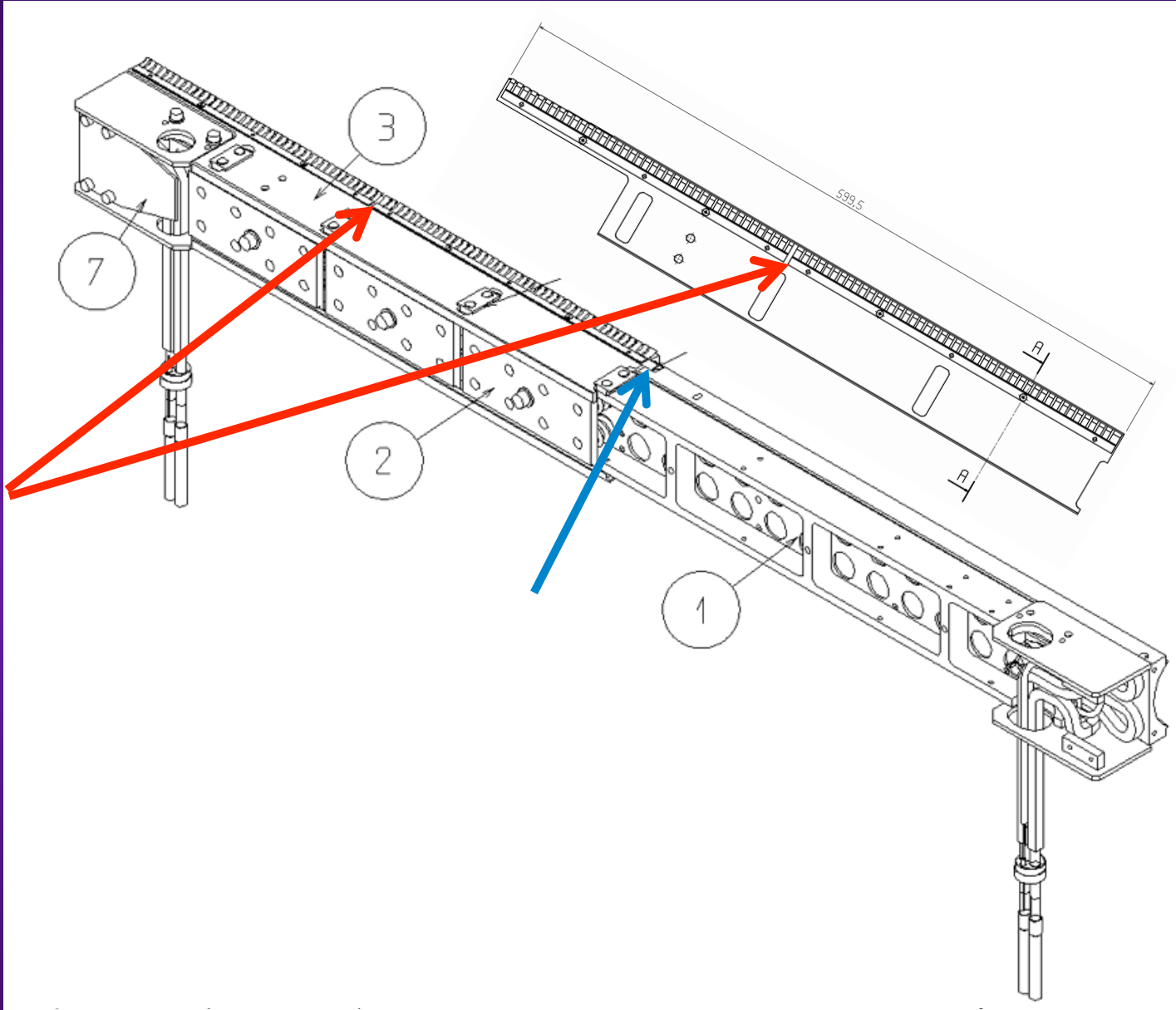


# DISCUSSION ON THE LHC PHASE 1 COLLIMATOR => RF question (06/10/2010)

Elias Métral and Ahmed Cherif

- ◆ **Question:** Should we add a “Liaison clamp” (see drawing LHCTCS\_\_0051 in the following drawings) at the place indicated by the red arrows?
- ◆ **Answer:** No, as it is the same piece of equipment (which is in Glidcop, i.e. an alloy of Cu and Al). Note that in the other case indicated by the blue arrow a “Liaison clamp” is need as there is a gap between 2 pieces

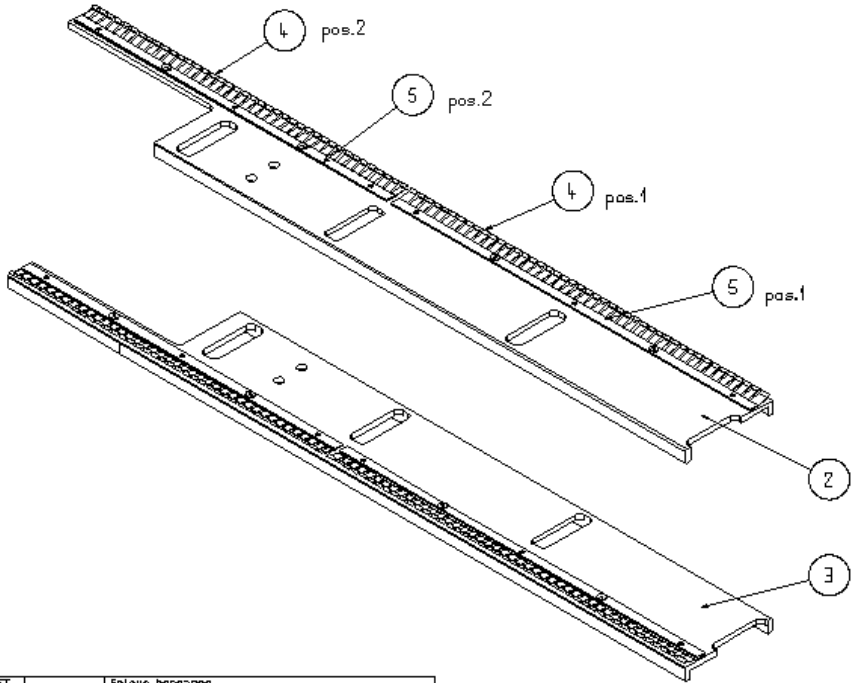
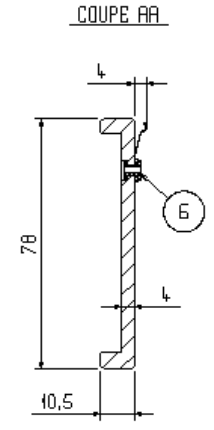
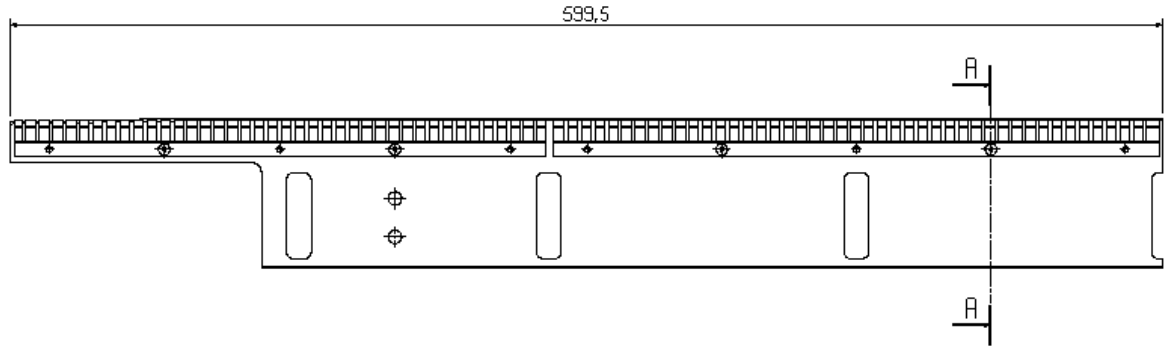


1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

DIMENSION : 1/4  
 TOLERANCES :  
 DIMENSIONS :  
 PROJECTION :

DIMENSIONS :  
 TOLERANCES :  
 DIMENSIONS :  
 PROJECTION :

DIMENSIONS :  
 TOLERANCES :  
 DIMENSIONS :  
 PROJECTION :

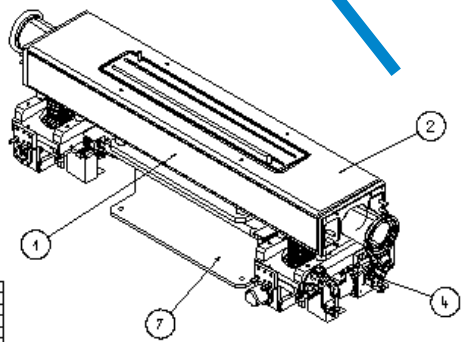
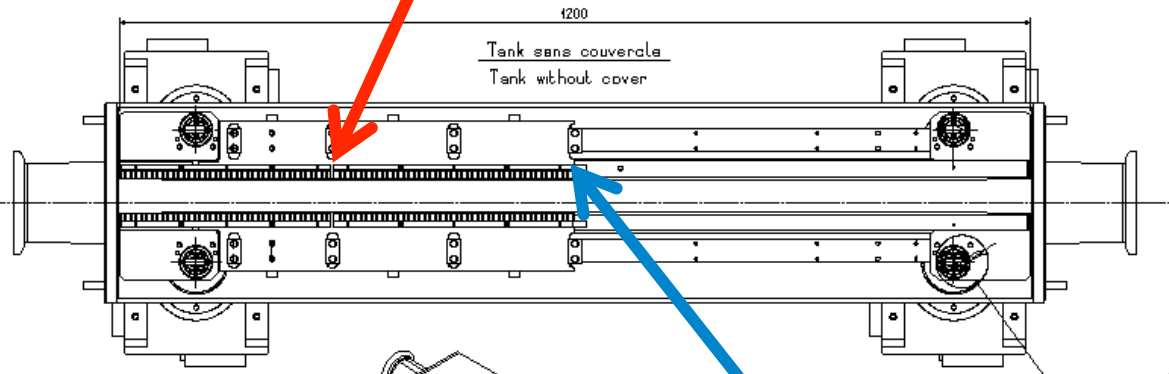
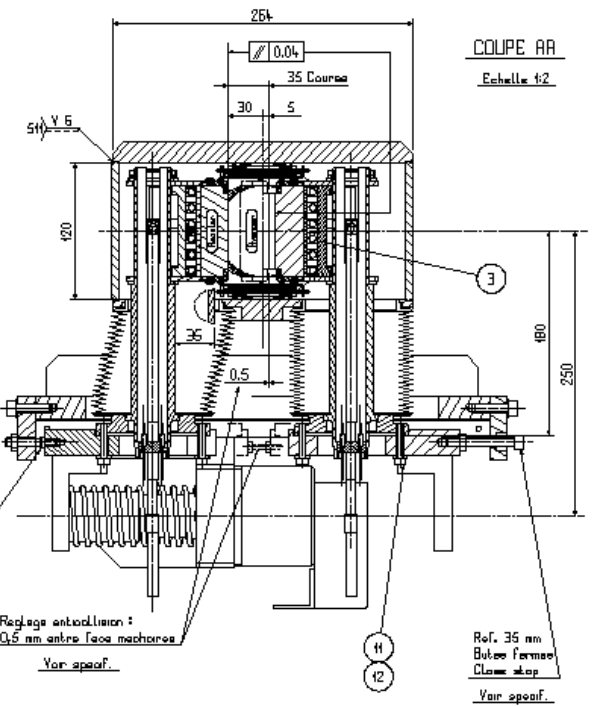
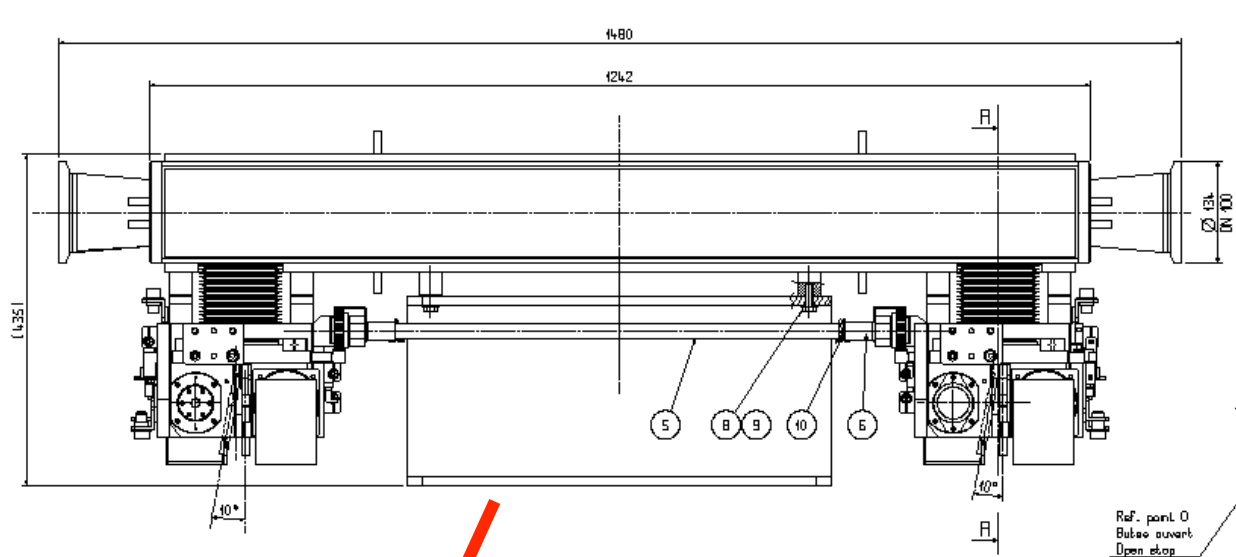


NOTE:  
 Nettoyer les rivets avant montage.  
 Après serrage, extraire la tige centrale du rivet.  
 NOTA:  
 Clean the rivets front assembly  
 After tightening, to extract the rod stem from the rivet.

QUANT	DESCRIPTION	POS	MAT.	OBSERVATIONS	REF/DEFIN
6	Pop rivet Ø 3.2		Copper	40 par bloc	
40	Rivet pop Ø 3.2		Cuivre	40 par bloc	
5	RF contact tightening bar			LHCTCS...0050	
4	Barrette serrage contact RF			4 par bloc	
4	RF contact			LHCTCS...0049	
4	Contact RF			4 par bloc	
3	Left end clamp			LHCTCS...0048	
2	Clamp extrémité gauche			2 par bloc	
2	Right end clamp			LHCTCS...0047	
2	Clamp extrémité droite			2 par bloc	
1					

IND.	DATE	NOM/NAME	ZONE	MODIFICATION
C	2005-08-14	R. PERRET		Enlève bossages
B	2005-08-11	L. FAVRE		Serie
A	2005-08-11	L. FAVRE		Mise à jour serie

SECONDARY COLLIMATOR		RELEVÉ PAR	DES/DR	2004-08-27
CONTACT RF COLLIMATOR TCS		FOR EXECUTION	L. FAVRE	2005-08-16
CONTACT RF ASSEMBLY ON BLOCK			A. BERTARELLI	2005-08-16
CONTACT RF COLLIMATEUR TCS			D. METALE	2005-08-23
ASSEMBLAGE CONTACT RF SUR CLAMP				
			LHCTCS...0045	2



Ref. point O  
Butée ouvert  
Open stop  
Voir specif.

Réglage anto-rotation :  
0,5 mm entre faces machonnées  
Voir specif.

COUPE AA  
Echelle 1:2

Ref. 35 mm  
Butée fermée  
Close stop  
Voir specif.

Mettre en contact l'écrou  
marrer légèrement, puis  
rabaisser la tige de l'écrou  
dans la fente de l'axe  
  
Place the nut without  
tightening prevent nut  
from turning by folding up

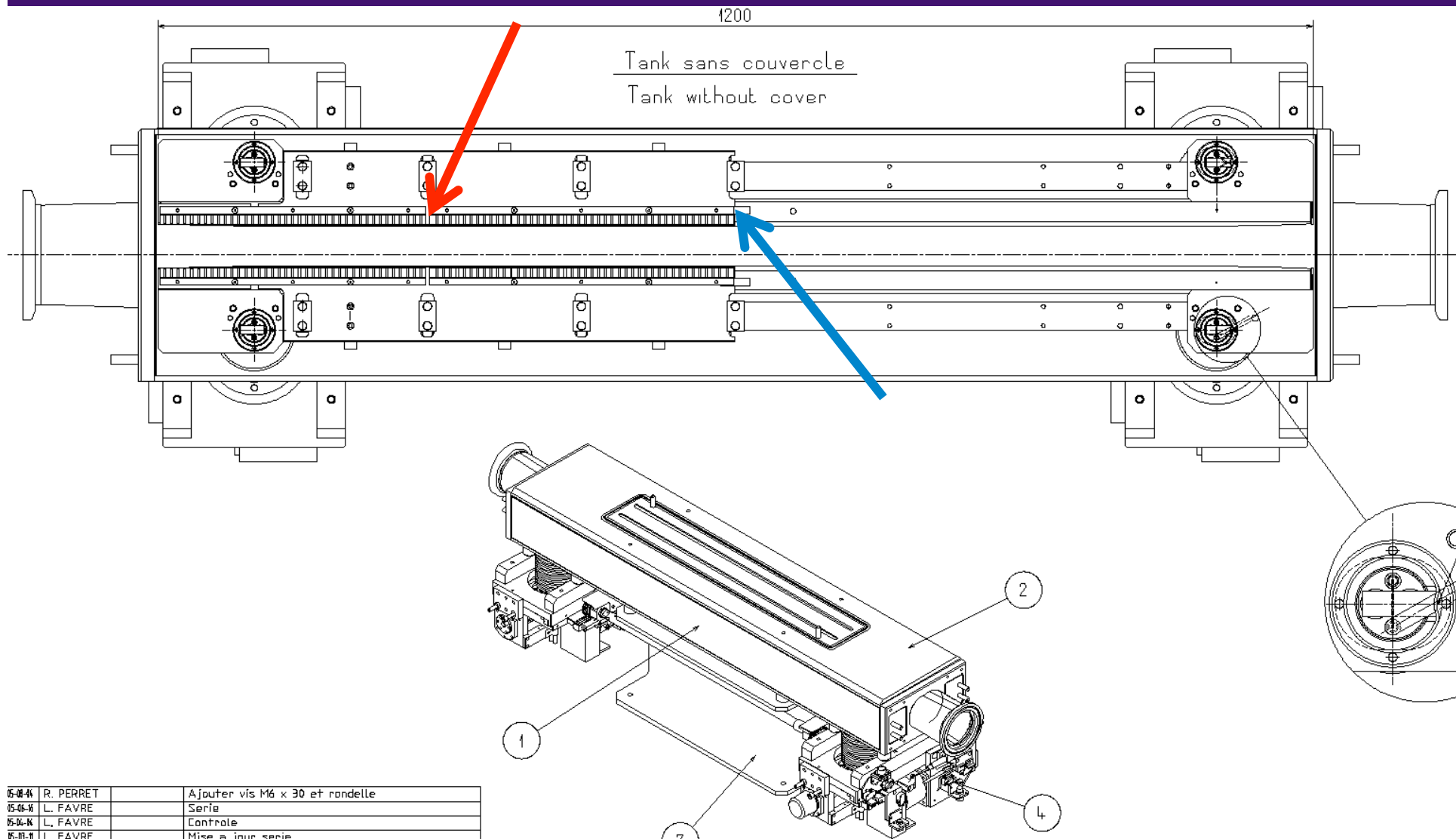
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13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36

E	NEGA R PERRET	Ajouter vis M6 x 30 et rondelle		
D	36-04 L FAVRE	Série		
C	NEGA L FAVRE	Lot final		
B	36-04 L FAVRE	Mise à jour série		
A	36-04 L FAVRE	Mise à jour		
REV.	DATE	DESIGNER	ZONE	PROJECTION

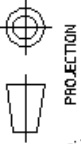
36	Spring lock washer M6	12	ST. Steel				
	Rondelle ressort à bas N6		Ac. Inox				
36	Hexagone acier bachelé M x 30	11	ST. Steel				
	Vis DMC M6 x 30		Ac. Inox				
4	Couille Ø11 x 2,5	10	ZINC SHAL				
	Chapelle renforcée Ø 2,5		Acier inox				
4	Plat washer M6	9	ST. Steel				
	Rondelle plate M6		Ac. Inox.				
4	Hexagone acier M6 x 30	8	ST. Steel				
	Vis hexagonale M6 x 30		Ac. Inox.				
1	Transport support	7					
	Support transport		LHCTCS_0021				
4	Schéma axe plate	6					
	Carte schéma axe plate		LHCTCS_0020				
2	Table angulaire 0/90/180 axe	5					
	Ass. fixation angulaire plate		LHCTCS_0149				
2	Table assemblé	4					
	Directeur platine		LHCTCS_0071				
1	Block and contact RF assembly	3					
	Composé bloc et contact RF		LHCTCS_0006				
1	Tank cover assembly	2					
	Dissemble couvercle tank		LHCTCS_0014				
1	Tank sans dessus	1					
	Tank sans dessus		LHCTCS_0002				

REVISION		SÉRIE		DATE		REV.	
DESCRIPTION		REVISION		DATE		REV.	
COLLIMATOR TCS		REVISION		DATE		REV.	
ASSEMBLY		REVISION		DATE		REV.	
COLLIMATEUR TCS		REVISION		DATE		REV.	
ENSEMBLE		REVISION		DATE		REV.	
PROJECT ENGINEER		DESIGNER		DATE		REV.	
LHCTCS_0001		LHCTCS_0001		LHCTCS_0001		LHCTCS_0001	



0.1	> 0.0075	> 0.001
0.15	> 0.01	> 0.0015
0.2	> 0.015	> 0.002
0.25	> 0.02	> 0.0025
0.3	> 0.025	> 0.003
0.4	> 0.03	> 0.004
0.5	> 0.04	> 0.005
0.6	> 0.05	> 0.006
0.8	> 0.07	> 0.008
1	> 0.09	> 0.01
1.2	> 0.11	> 0.012
1.5	> 0.14	> 0.015
2	> 0.18	> 0.02
2.5	> 0.23	> 0.025
3	> 0.29	> 0.03
4	> 0.36	> 0.04
5	> 0.45	> 0.05
6	> 0.56	> 0.06
8	> 0.72	> 0.08
10	> 0.9	> 0.1

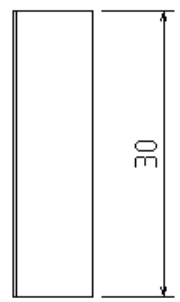
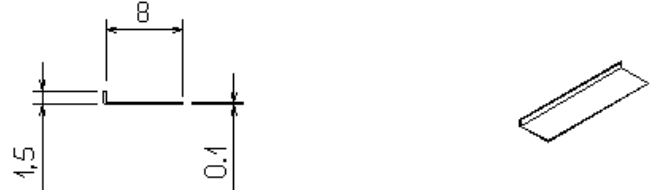
DESSIN : RUGOSITE, TOLERANCES  
 SELON : NORME ISO  
 DRAWING : RUGOSITY, TOLERANCES  
 ACCORDING TO ISO STANDARD



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IND.	DATE	NOM/NAME	MODIFICATION
A	2004-10-07	L. FAVRE	Mise a jour
B	2005-03-06	L. FAVRE	Mise a jour
C	2005-04-01	L. FAVRE	Contrôle



Ebavurer, argente 5 microns  
 Deburr, silver plated 5 microns

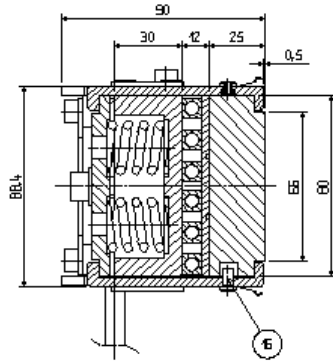
Ra 3.2

Ebavurer ISO 2768-m

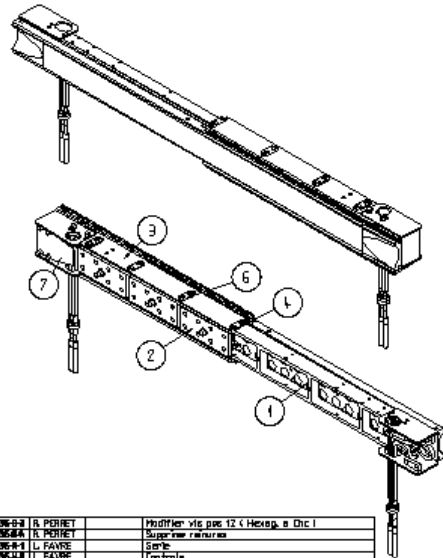
QUANT	DESCRIPTION	POS	MAT.	OBSERVATIONS	REF.CERN
1	slight strip 0.1		Copper beryllium	2 per block	
	Bande mince 0.1		Cuivre beryllium	2 par bloc	
ENG./ASS.		S.ENG./S.ASS.			
SECONDARY COLLIMATOR					ECHELLE SCALE 2:1
BLOCK COLLIMATOR TCS CONNECTION CLAMP					DES/DRA. L. FAVRE 2004-09-16
BLOC COLLIMATEUR TCS LIAISON CLAMP					CONTROLLED R. PEFFET 2005-04-06
					RELEASED O. ABERLE 2005-04-06
					APPROVED - -
					LHCT,TC...SERCOL000,T007,T0072104PL
					REPLACE/REPLACES
RELEASED BY PROJECT ENGINEER		FOR EXECUTION		QAC -	LHCTCS_0051
				SIZE 4	IND. C

**ASSEMBLY PROCEDURES:**

Place the springs in their housing and force them with the help of the plate pos. 2 (lightened against support plate).  
 Install the lower clamps with holding clips and thermal contact.  
 Install graphite block.  
 Install the upper clamps and thermal contact.  
 Release progressively the springs with help of the screws pos. 10-11. Remove these screws. Install the end cover plates without blocking the screws. (These plates allow to push the block against the vertical axis during the mounting into the vacuum tank).

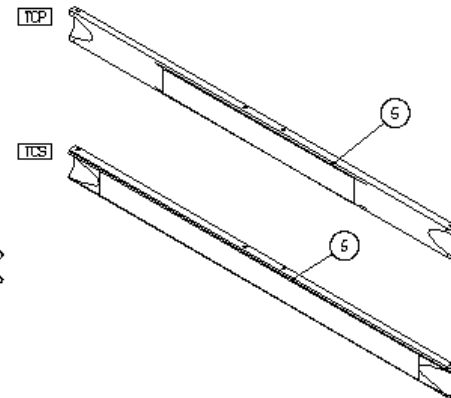
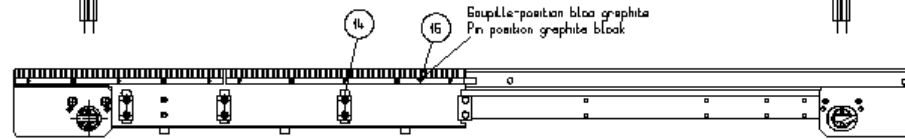
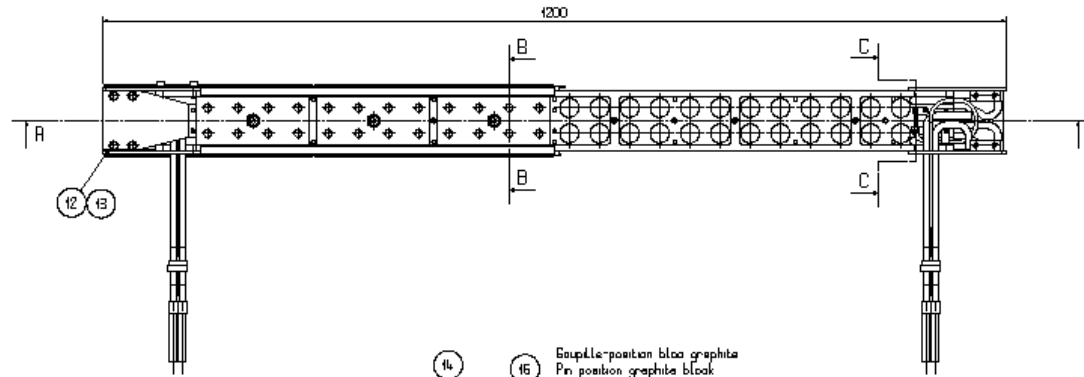
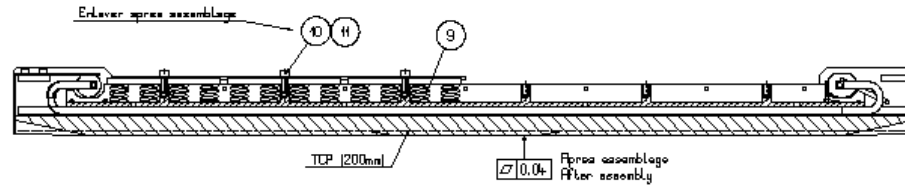


Coupe BB



F	36-04	R PERRET	PROJETEUR VIG. DUC 12 (Hexag. & Dnc 1)
E	36-04	R PERRET	Support rainures
D	36-04	L FAYRE	Grille
C	36-04	L FAYRE	Lim-train
B	36-04	L FAYRE	Mise à jour grille
A	36-04	L FAYRE	Mise à jour
REV.	DATE	MODIF.	ZONE

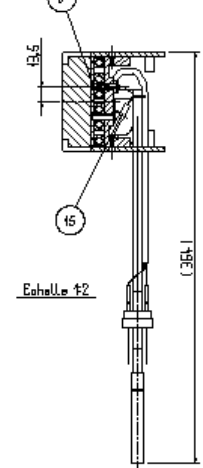
**COUPE AA**



**PROCEDURE DE MONTAGE:**

Placer les ressorts dans leur logement et les contraindre à l'aide de la plaque Rep. 2 (Serrer jusqu'en butée contre plaque support).  
 Installer les olamps inférieurs, à l'aide des laquets de maintien.  
 Installer le bloc graphite.  
 Installer les olamps supérieurs et contact thermique.  
 Détendre progressivement les ressorts à l'aide des vis Rep. 10-11, qu'il faut enlever totalement.  
 Installer les toiles de fermeture d'extrémité sans serrer les vis (elles permettent de plaquer le bloc sur les axes verticaux. A faire lors du montage dans l'ensemble à vide).

**Coupe CC**



Remarque:  
 Après assemblage, faire un test pour les sondes de température.

Poids ≈ 30Kgs

2	Plaque	17			
	Sonde				
3	Pare-choc (in hardened Ø 50)	18	St. steel		
4	Grille cyl. rectif. Ø 50	18	Ac. inox	Ø 5 n6	
5	Grille probes temperature				
6	Clampage sonde temperature				
7	Clampage sonde temperature				
8	Hexagonal casted handles M6 x 16	14	St. steel		
9	Vis DHE M6 x 16	14	Ac. inox		
10	Lockwasher M6	15	St. steel		
11	Rondelle groove M6	15	Ac. inox		
12	Hexagonal casted handles M6 x 16	12	St. steel		
13	Vis Dnc M6 x 16	12	Ac. inox		
14	Platib washer M6	11	St. steel		
15	Rondelle plate M6	11	Ac. inox		
16	Hexagonal casted handles M6 x 25	10	Steel	not stainless - sticking	
17	Vis DHE M6 x 25	10	Ac. inox	Pass inox = gripper	
18	Spring	9		D20 ; to:33.5 ; dia: Auto push	
19	Resort	8			

2	Pivot tensioning plate	7			
	Plaque tension pivot				
4	Holding clip	6			
	Support maintien				
1	Graphite block	5			
	Bloc graphite				
6	Connection clamp	4			
	Limçon clamp				
5A	Contact RF assembly in clamp	3			
	Assemblage contact RF en clamp				
6	Spring supporting plate	2			
	Plaque support ressort				
1	Plate and assembly	1			
	Assemblage plaque extrémité				
REV.	DESCRIPTION	REV.	DATE	DESIGN/DATE	REV/DATE
1	SECONDARY COLLIMATOR				
2	BLOCK COLLIMATOR TCS ASSEMBLY	1.3			
3	BLOCK ASSEMBLY	1.1			
4	ASSEMBLAGE BLOC COLLIMATEUR TCS	1.2			
5	ENSEMBLE BLOC				
REVISED BY	PROJECT ENGINEER	FOR EXEMPTION	DATE	BY	DATE