

Refno: PS/ML/Technical note/86-13  
Revised: 20 September 1986  
Author(s): Mats Möller  
Subject: Beam dimensions inside the quadrupoles of the AC-ring.

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### SCOPE

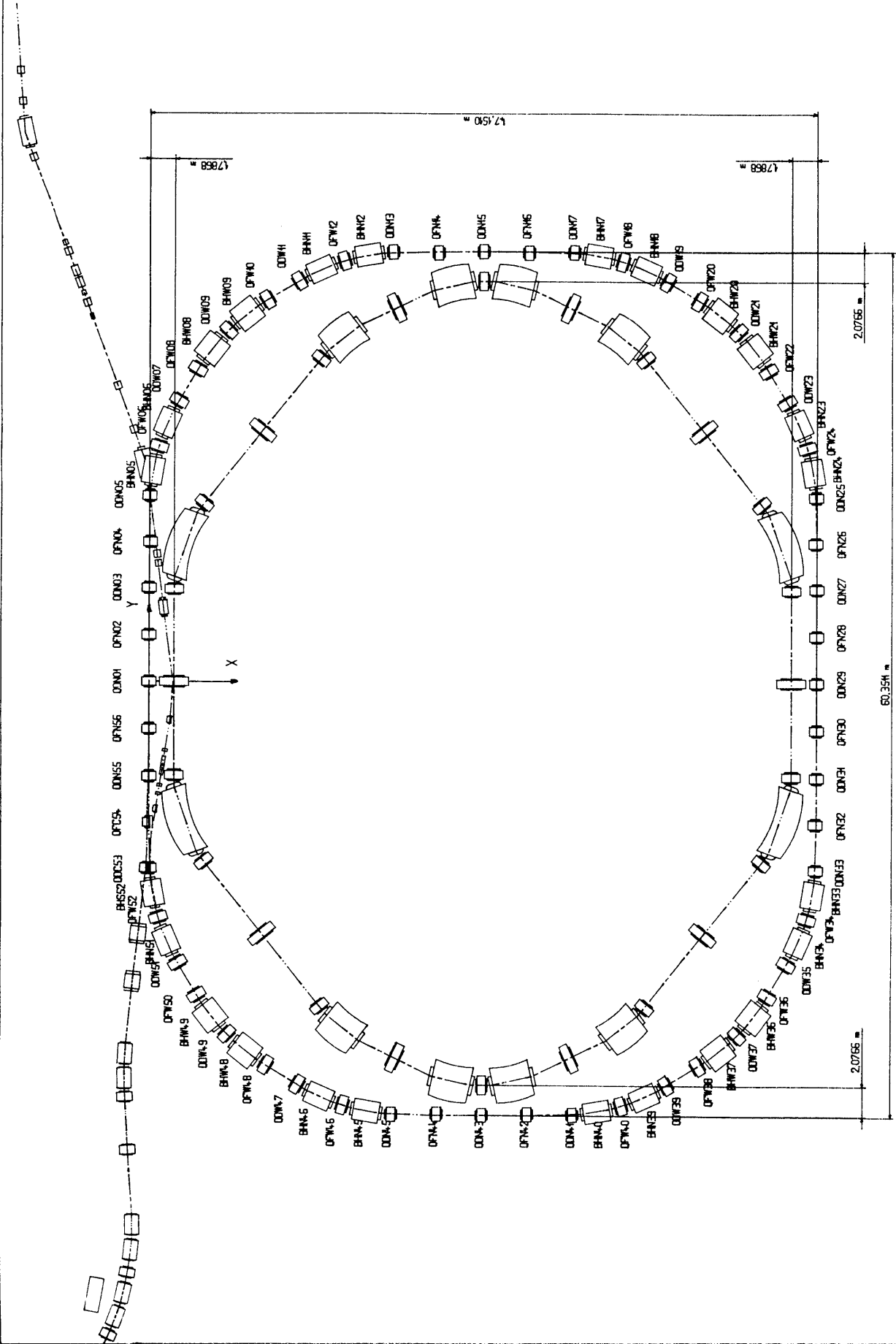
This catalogue presents the vertical cross-sections of the vacuum chambers with beam, beam-position electrodes and microwave resistors for the 56 quadrupoles in the ring.

The chambers, the electrodes and the 3 beams (i.e. circulating, injected and ejected) are introduced into the CAD-system. It has therefore been possible to make cuts at any location around the ring and then directly produce a drawing with the dimensions of the beam and the relative positions beam-chamber-electrode. This work has been done in order to check that there is a free path for the beams at all places where there are equipment penetrating into the chambers. The cross-sections are also used for the positioning of the microwave resistors in the  $\phi 140$  diameter chambers.

All cross-sections follows the rule: the beam is always pointing into the paper and the center of the ring is on the right side.

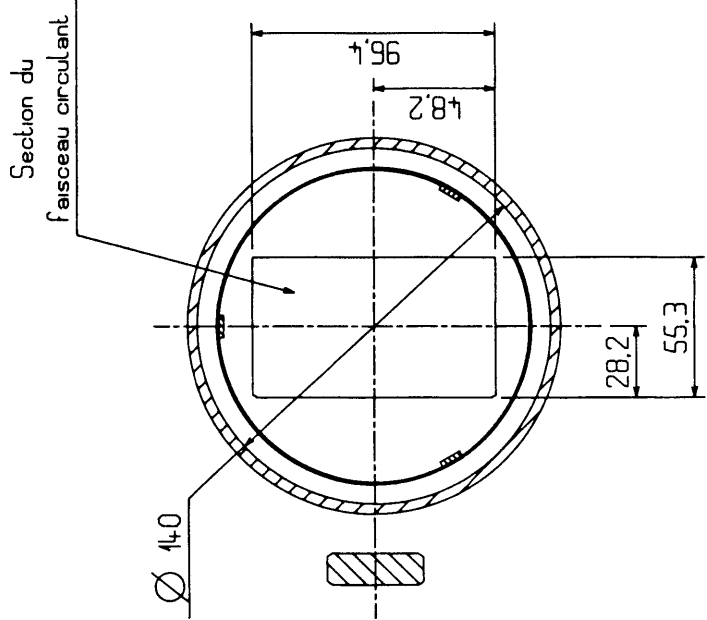
**Note:** the pick-up electrode in section 53 is missing (the dimensions of this D-shaped electrode are not yet defined).

**Distribution:** B.Autin, E.Boltezar, F.Caspers, H.Horisberger, E.Jones, F.Malthouse, M.Martini, S.Milner, P.Oreberg, A.Poncet, P.L.Riboni, M.Zanolli

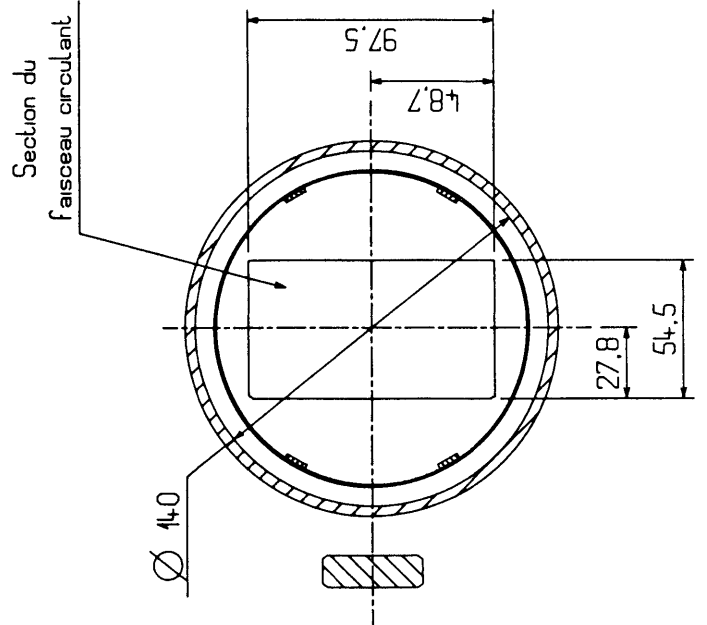


ANTIPROTON ACCUMULATOR  
LAYOUT  
H-OK-4986

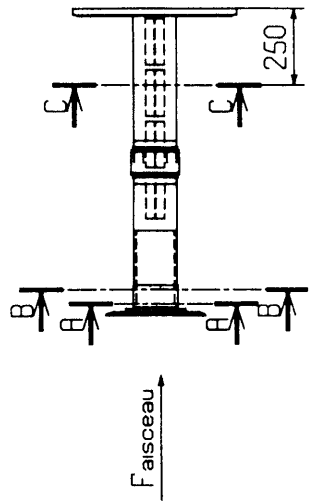
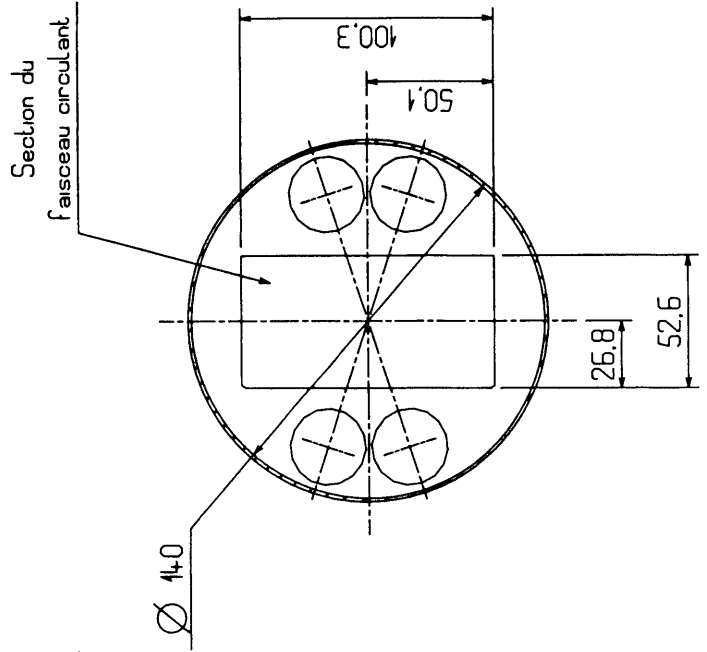
A-A



B-B



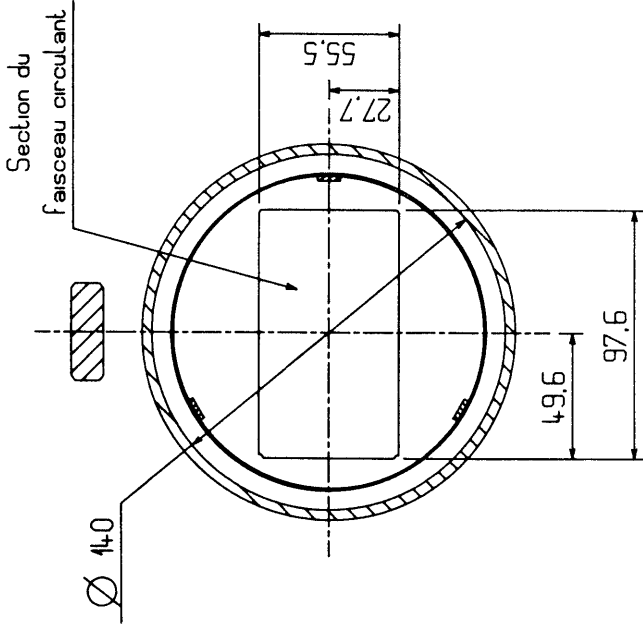
C-C



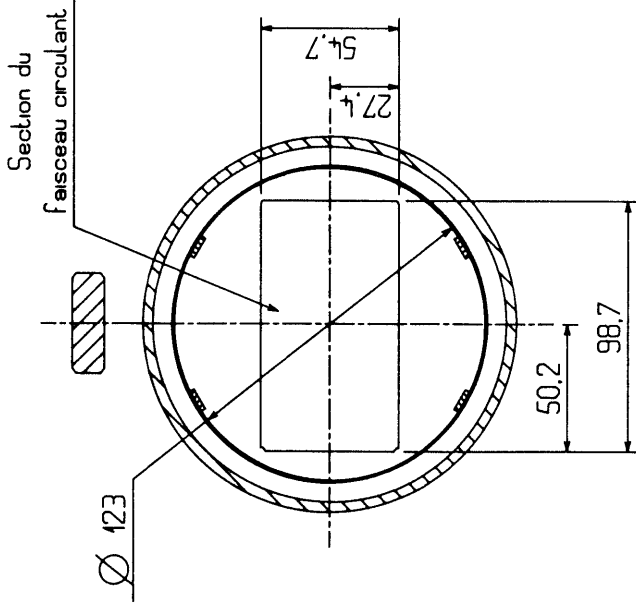
Vue depuis le centre de l'anneau

Beam dimensions inside the quadrupoles of the AC ring 01

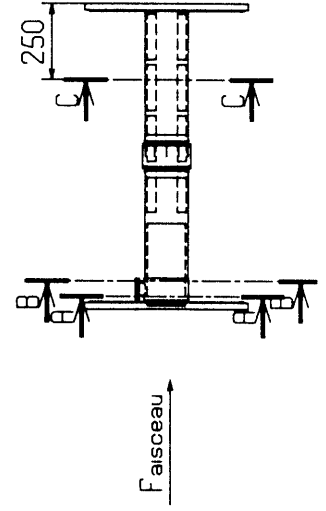
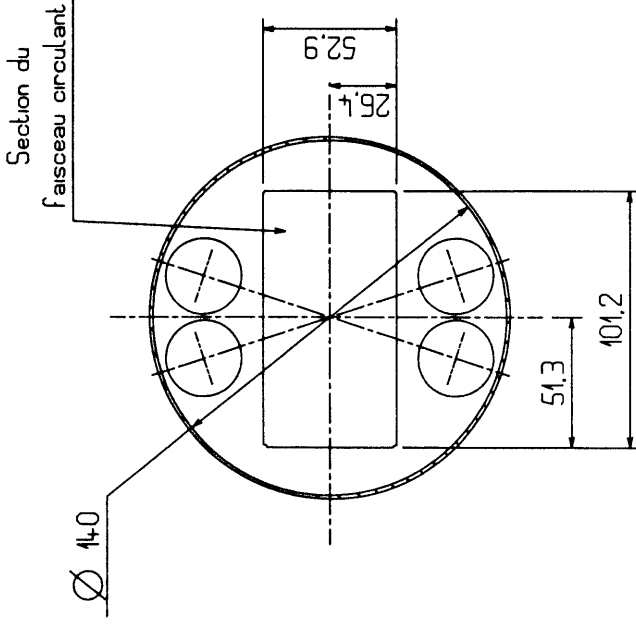
A-A



B-B

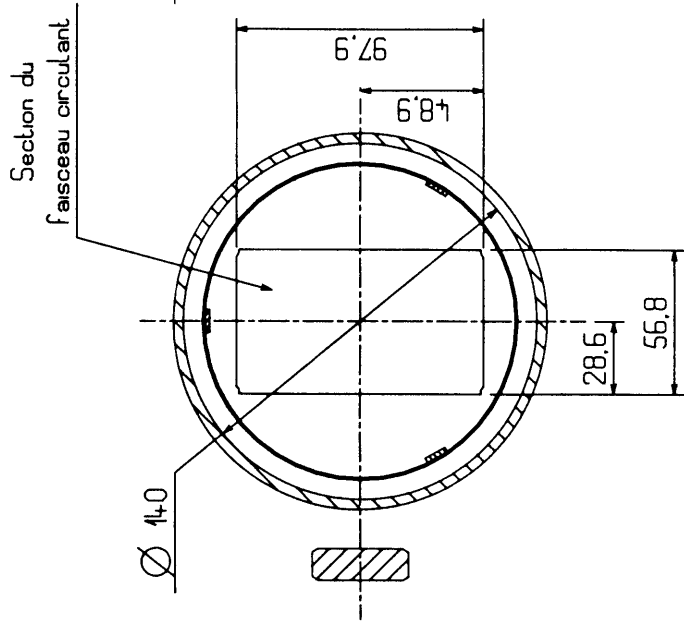


C-C

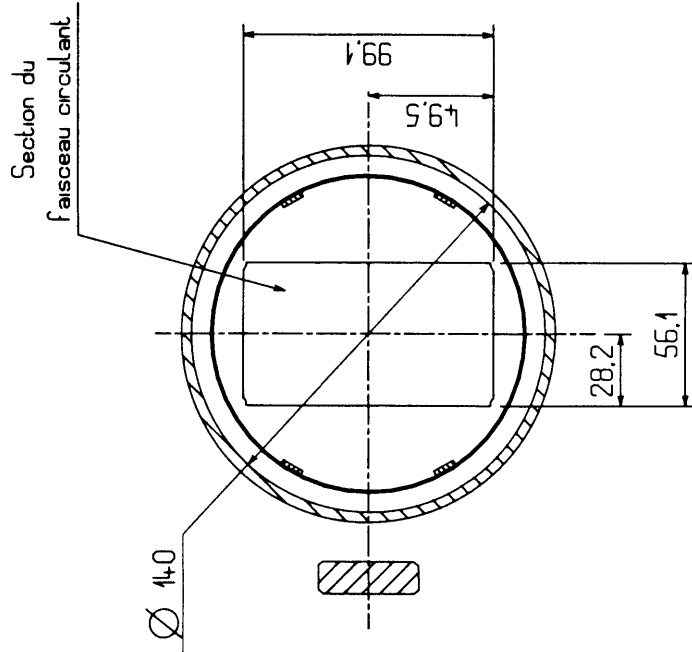


Beam dimensions inside the quadrupoles  
of the AC ring 02

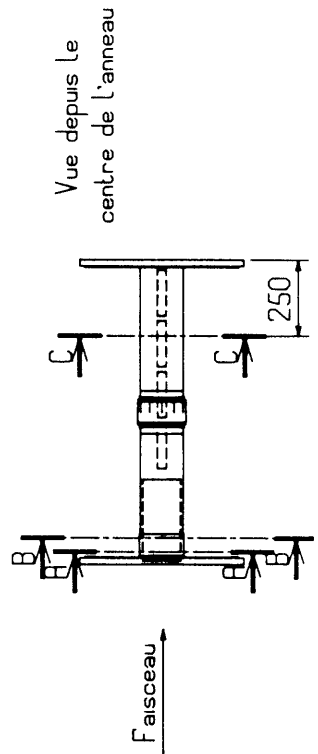
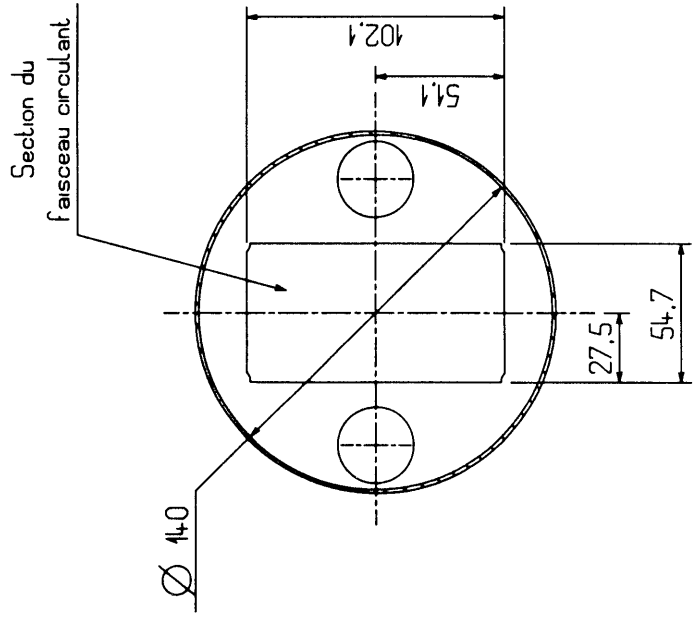
A-A



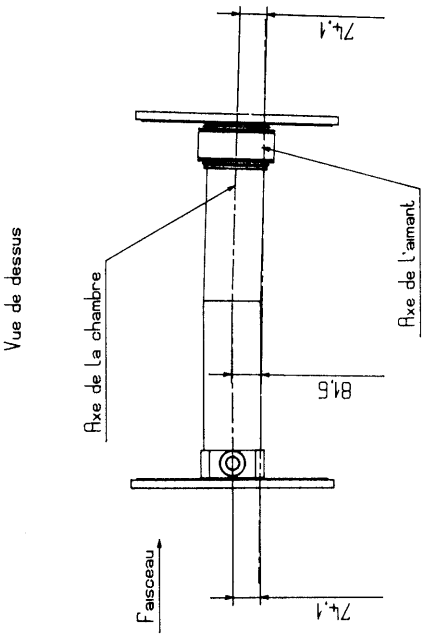
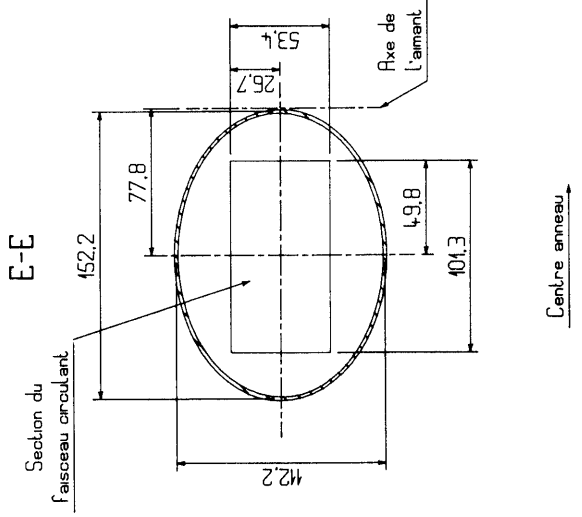
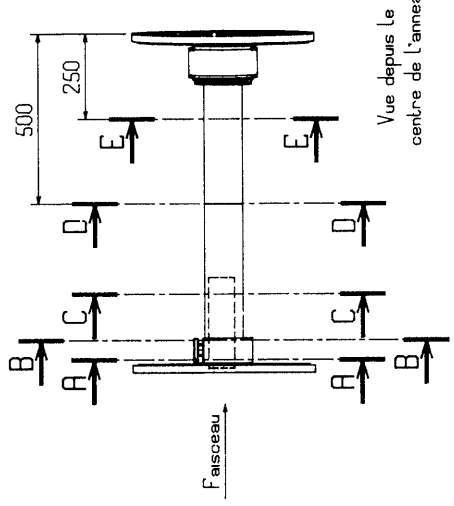
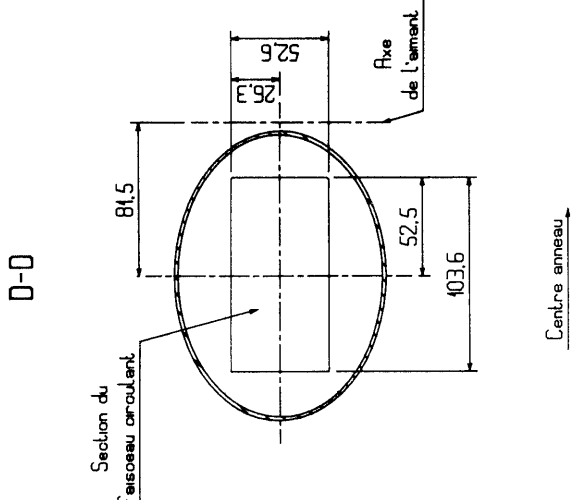
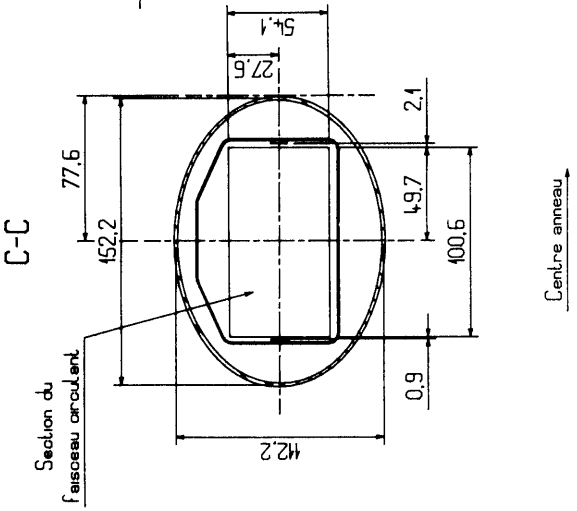
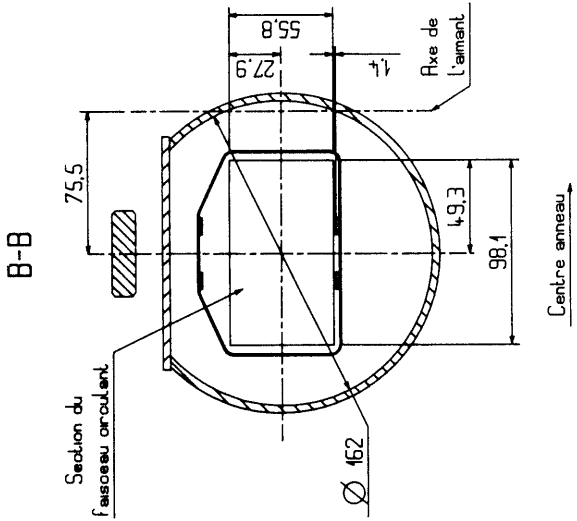
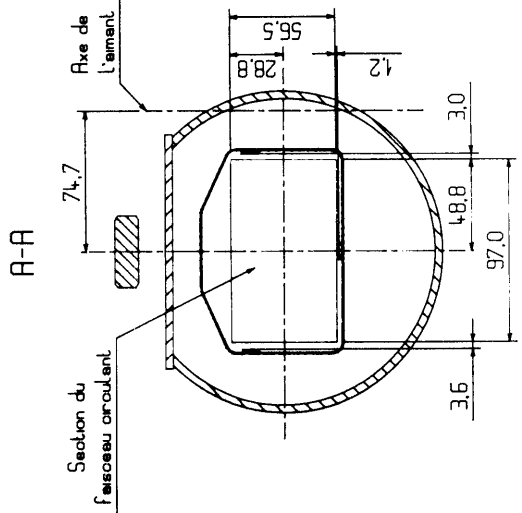
B-B



C-C

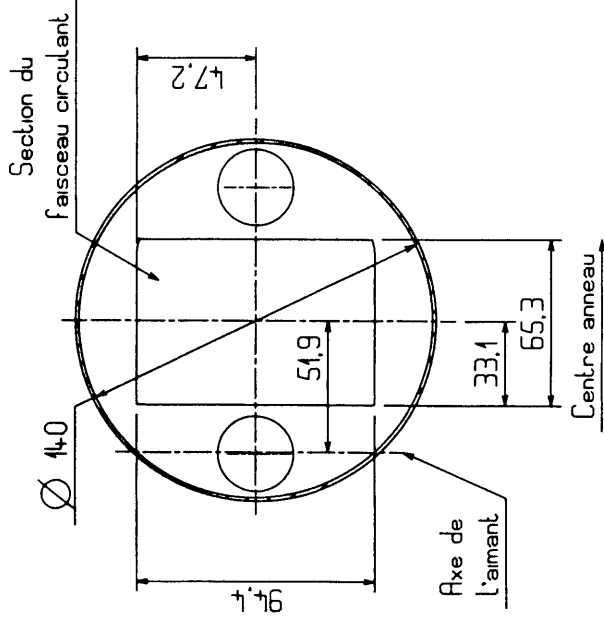


Beam dimensions inside the quadrupoles  
of the AC ring 03

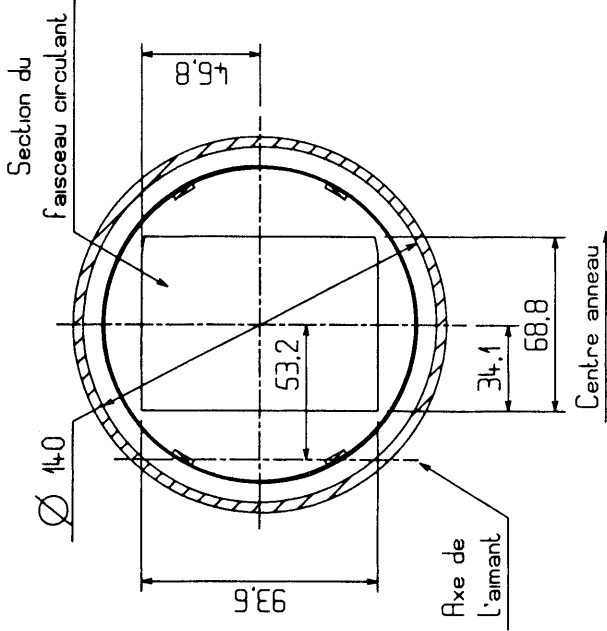


Beam dimensions inside the quadrupoles  
of the AC ring **04**

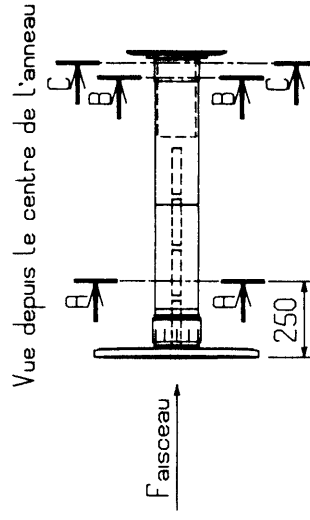
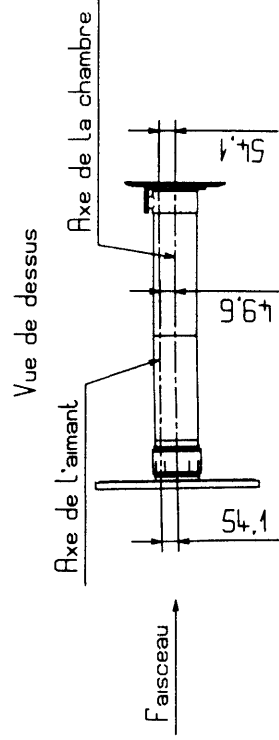
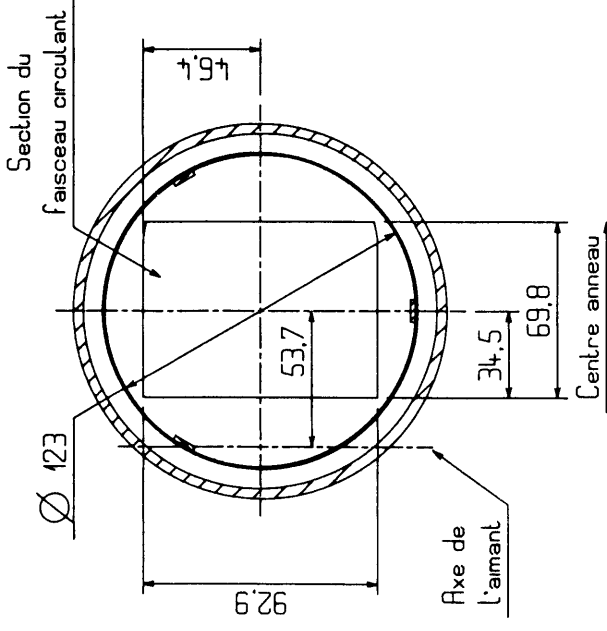
A-A



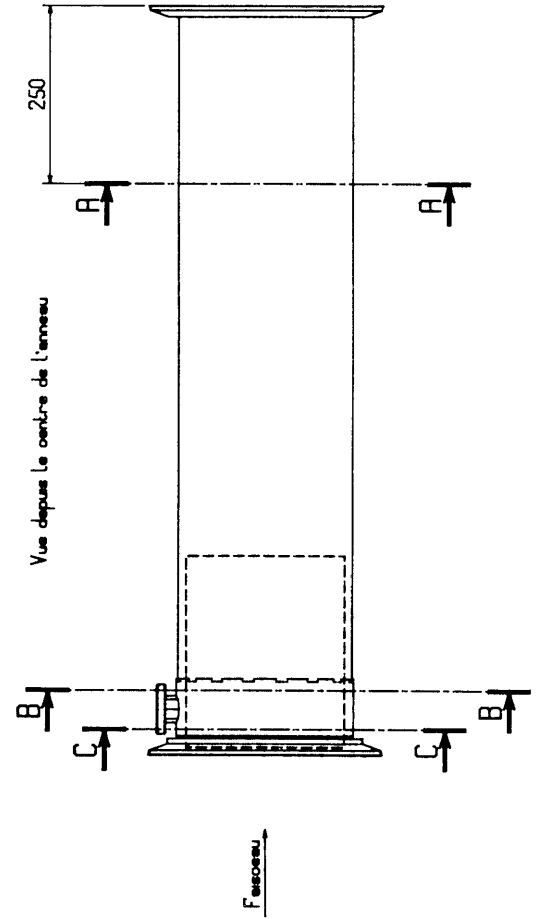
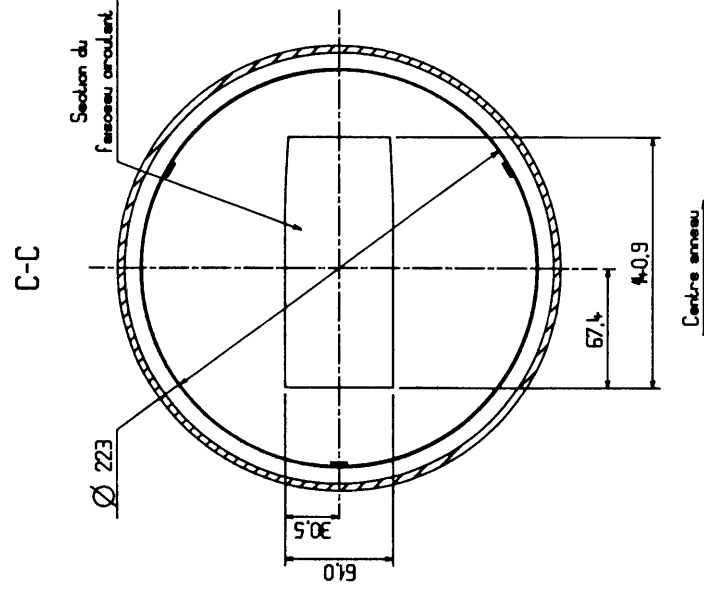
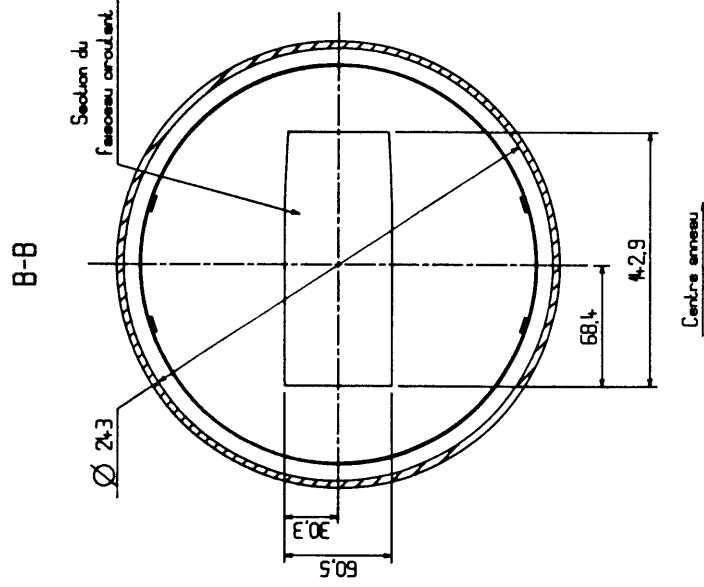
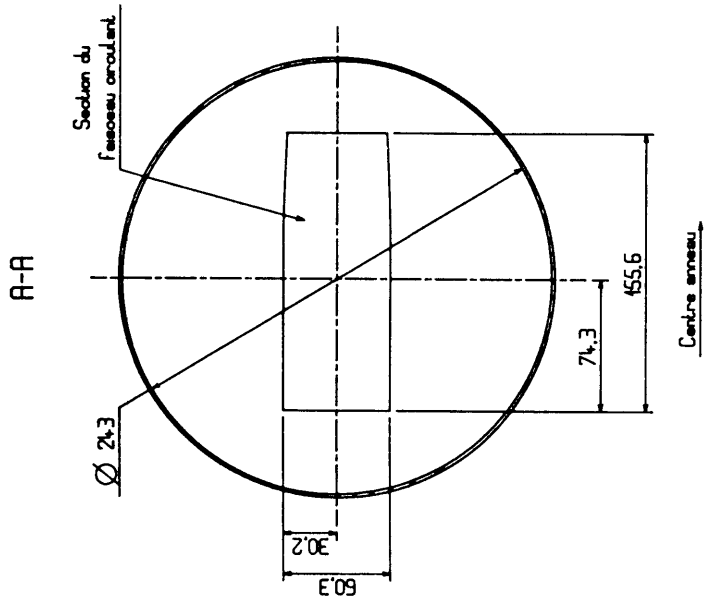
B-B



C-C

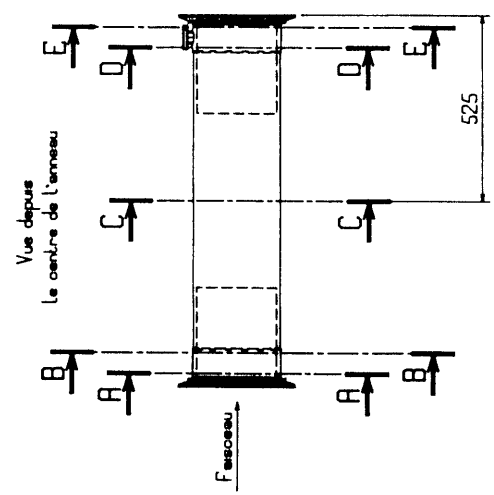
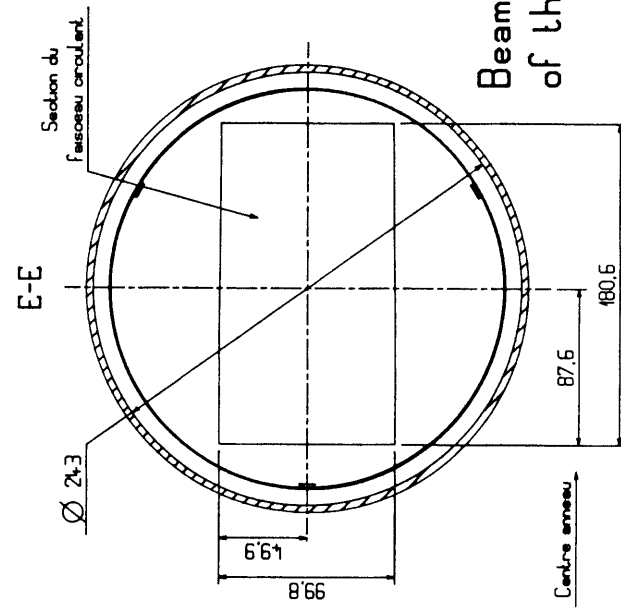
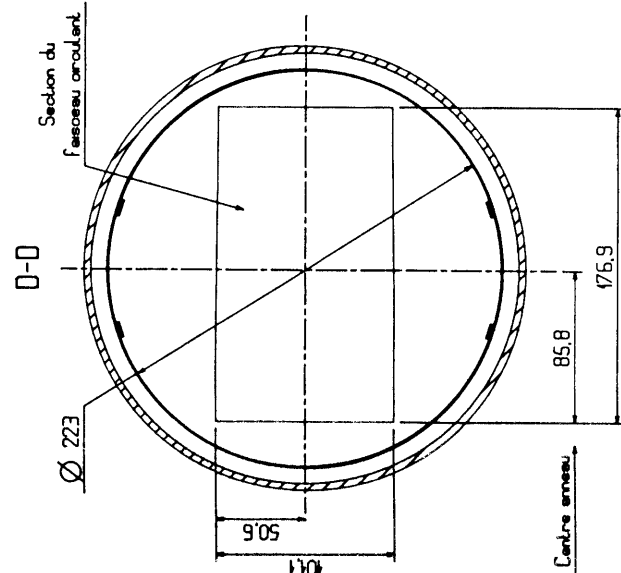
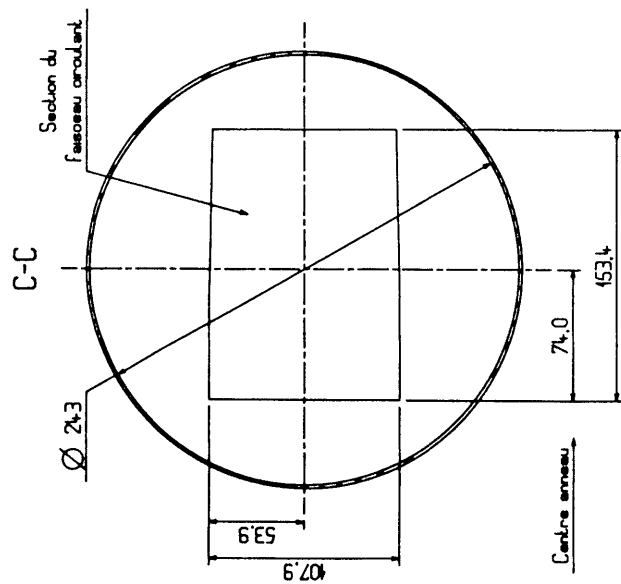
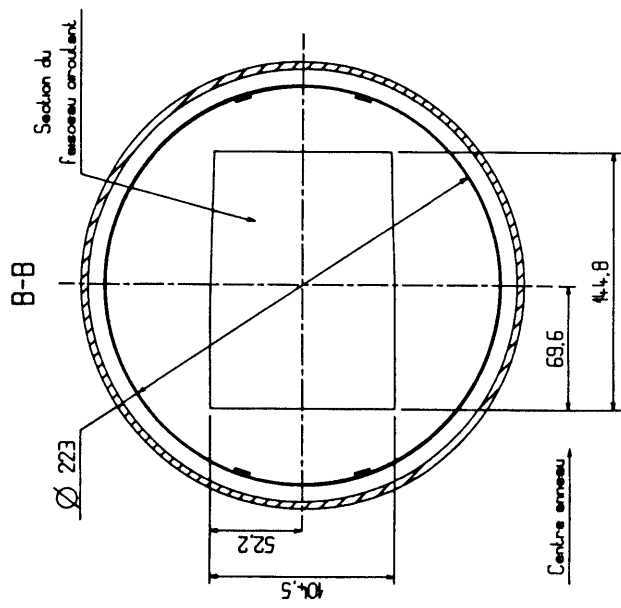
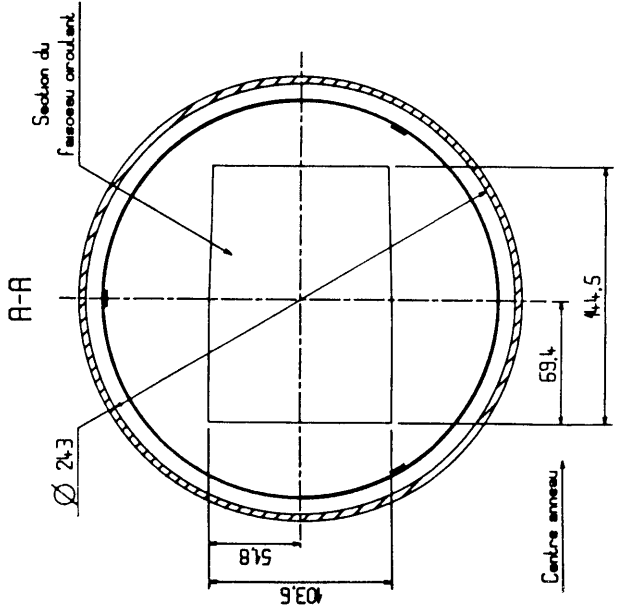


Beam dimensions inside the quadrupoles  
of the AC ring 05



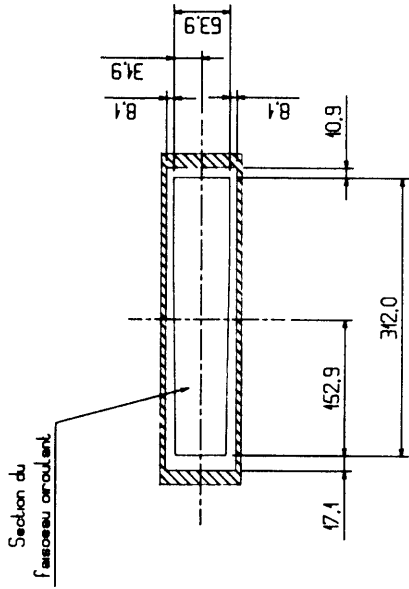
Beam dimensions inside the quadrupoles  
of the AC ring 06



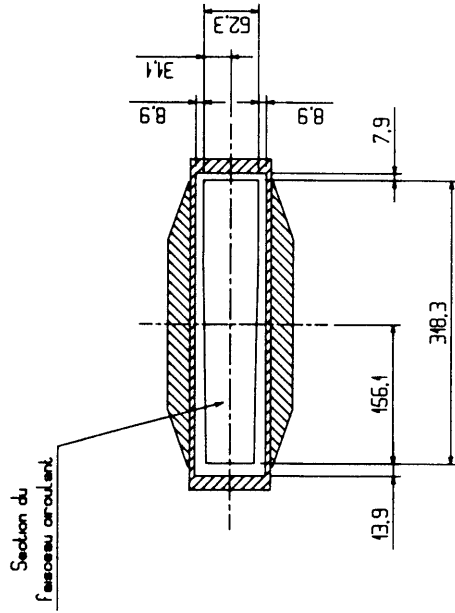


Beam dimensions inside the quadrupoles of the AC ring 07

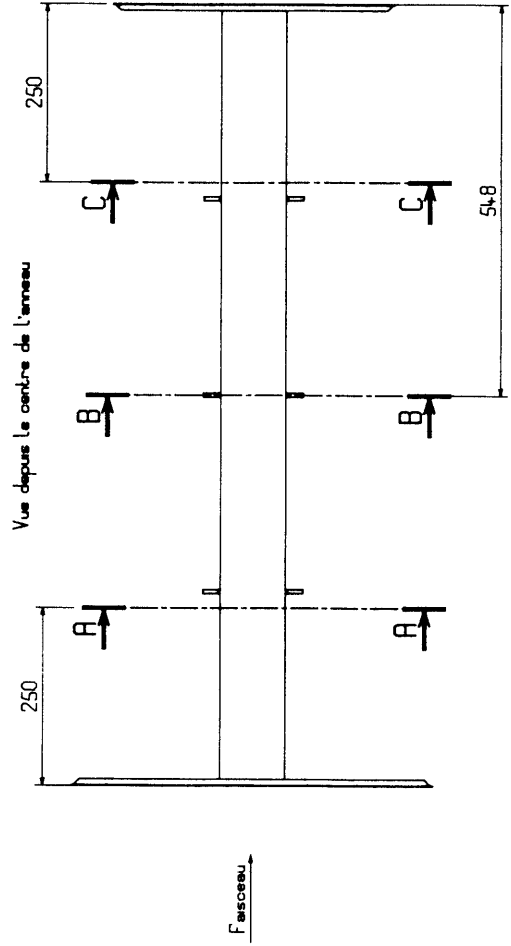
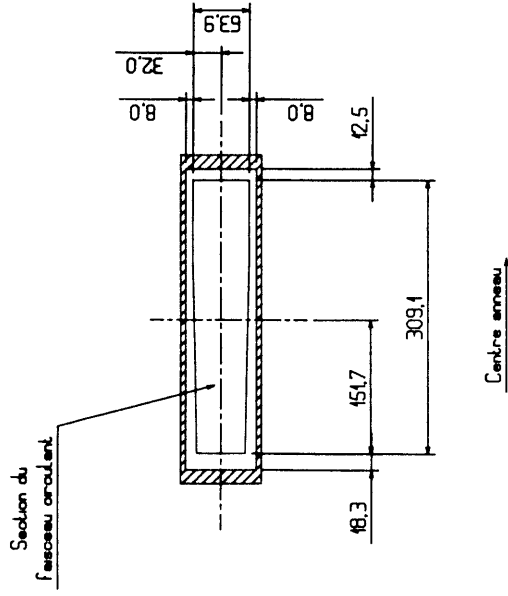
A-A



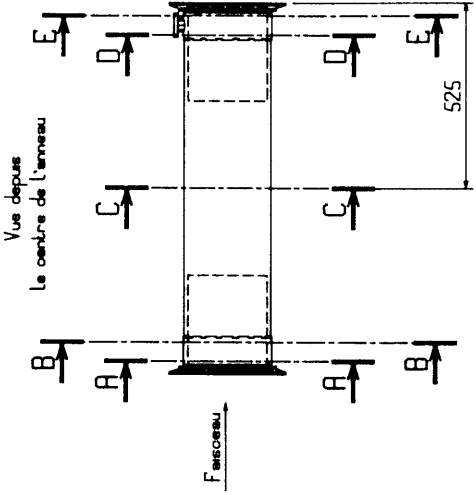
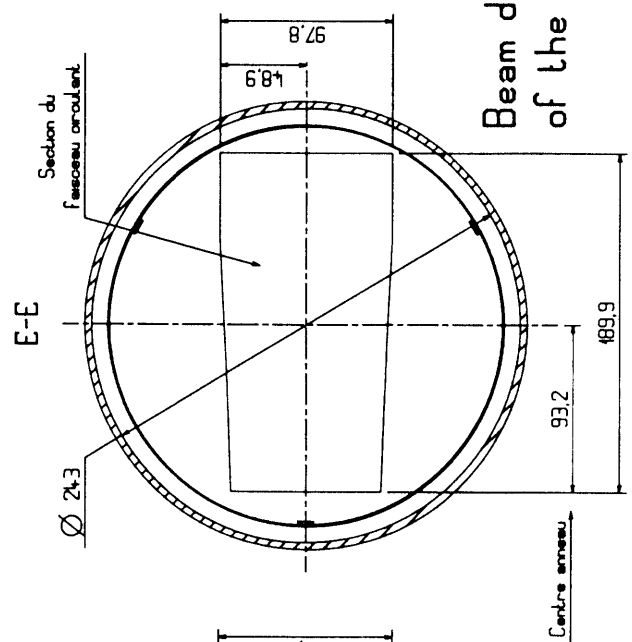
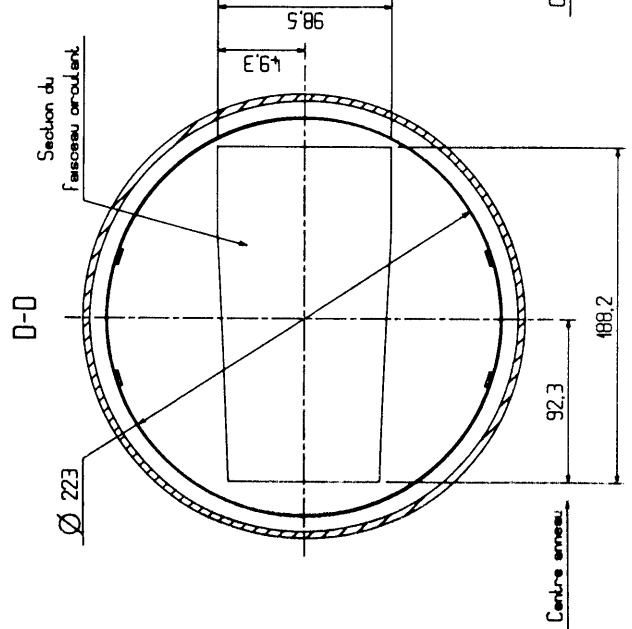
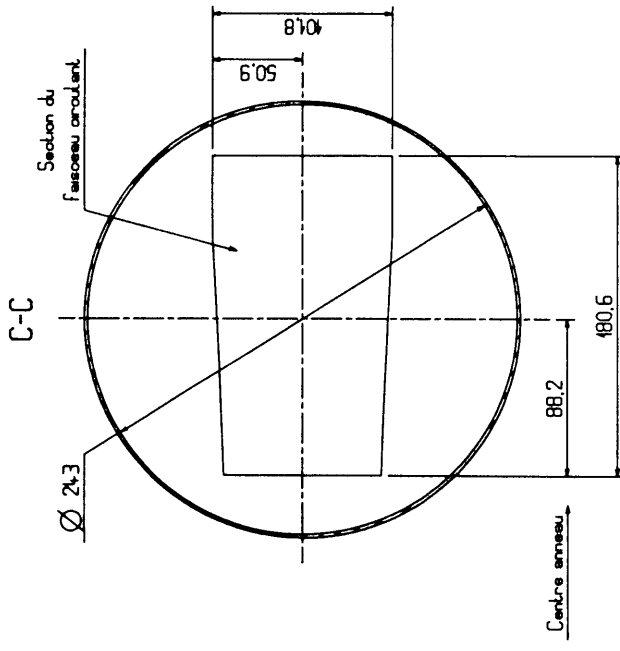
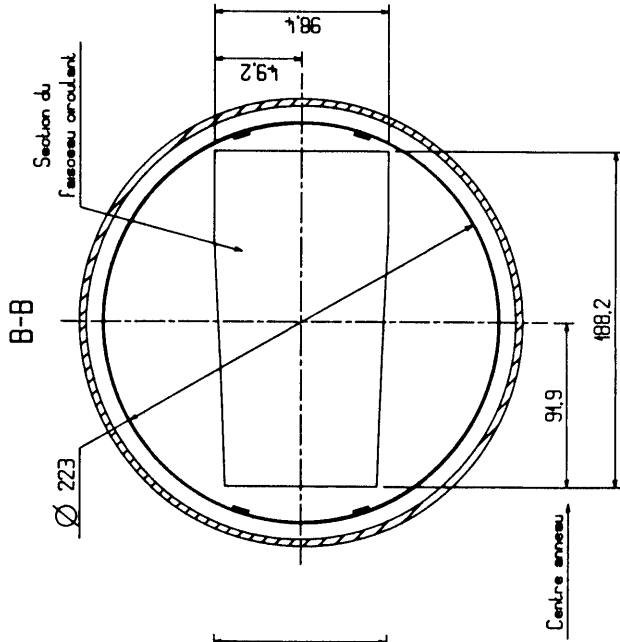
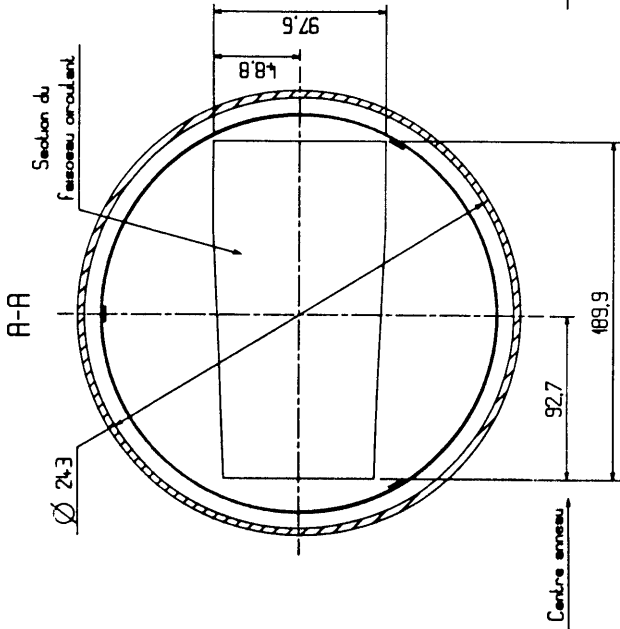
B-B



C-C



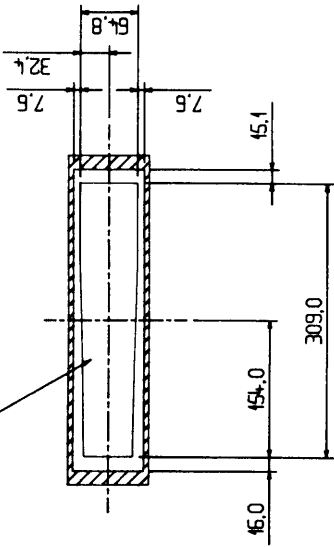
Beam dimensions inside the quadrupoles  
of the AC ring 08



Beam dimensions inside the quadrupoles  
of the AC ring 09

A-A

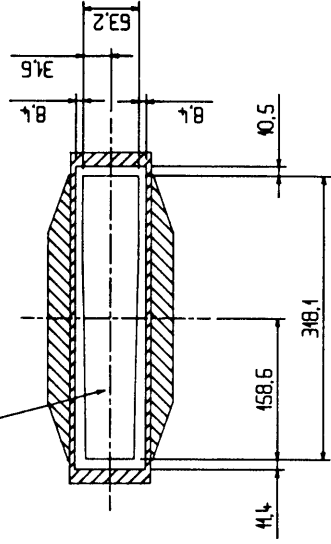
Section du faisceau circulant



Centre anneau

B-B

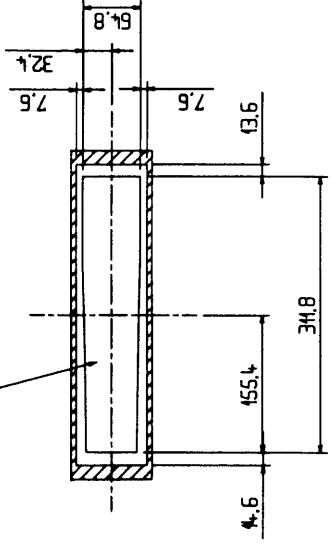
Section du faisceau circulant



Centre anneau

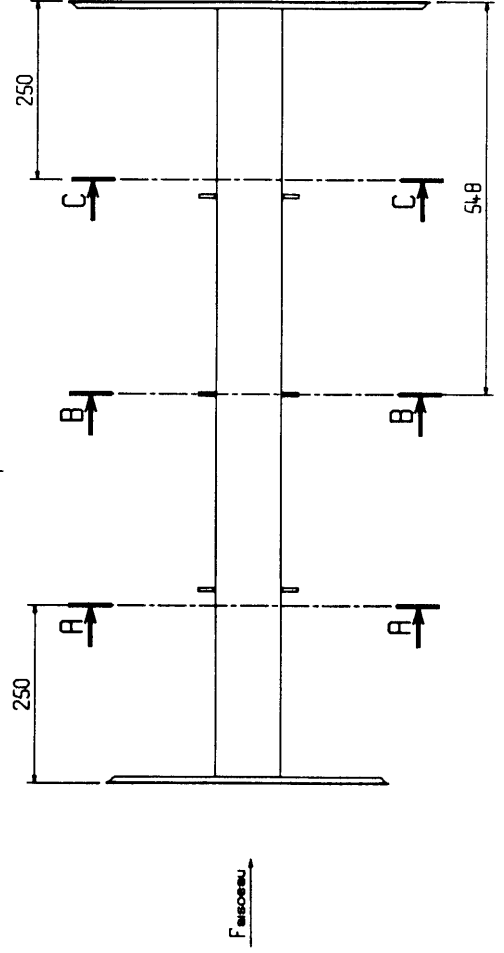
C-C

Section du faisceau circulant

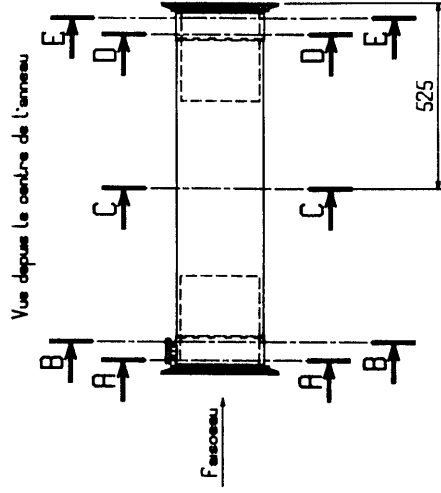
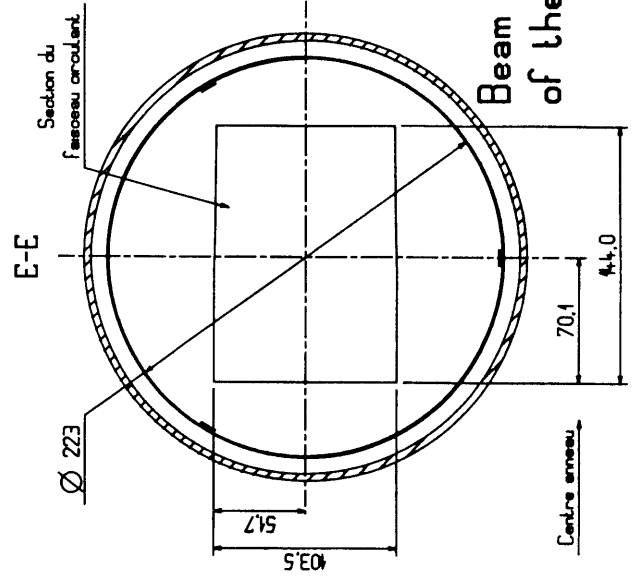
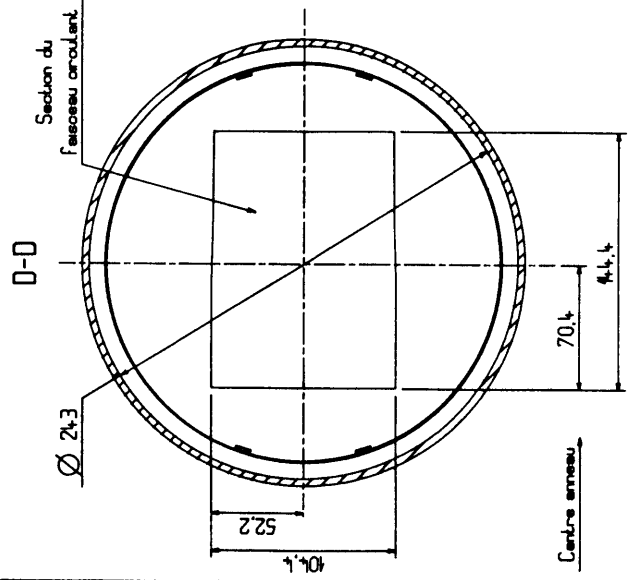
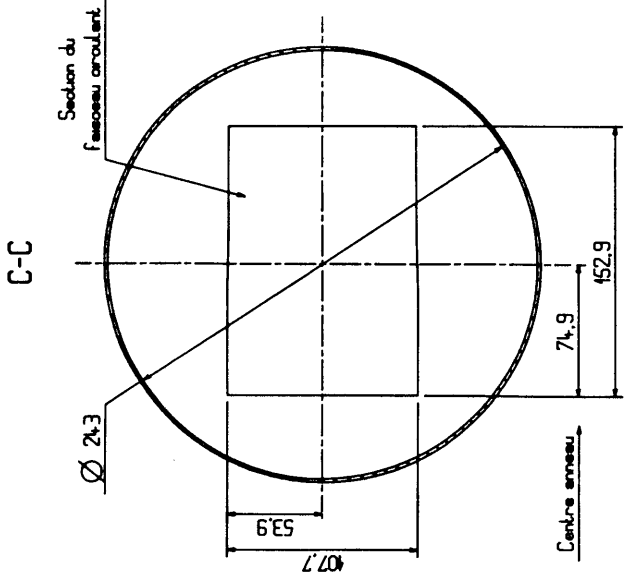
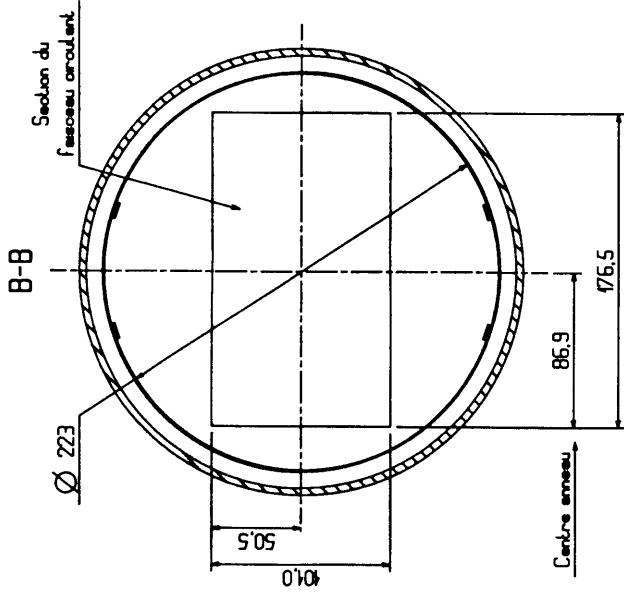
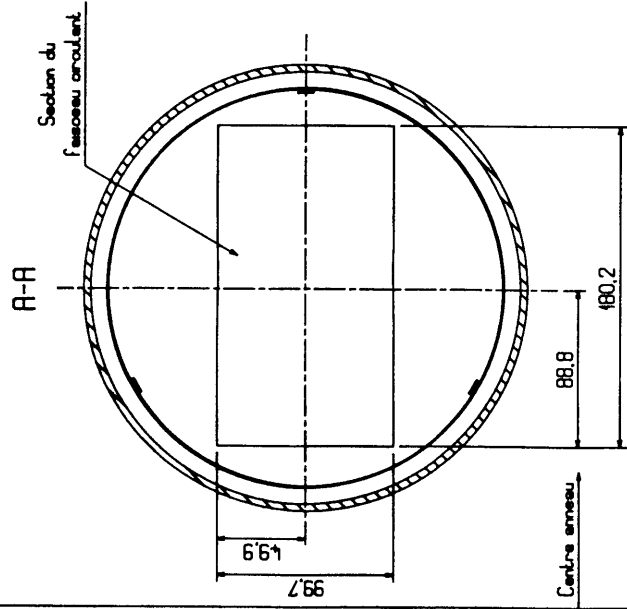


Centre anneau

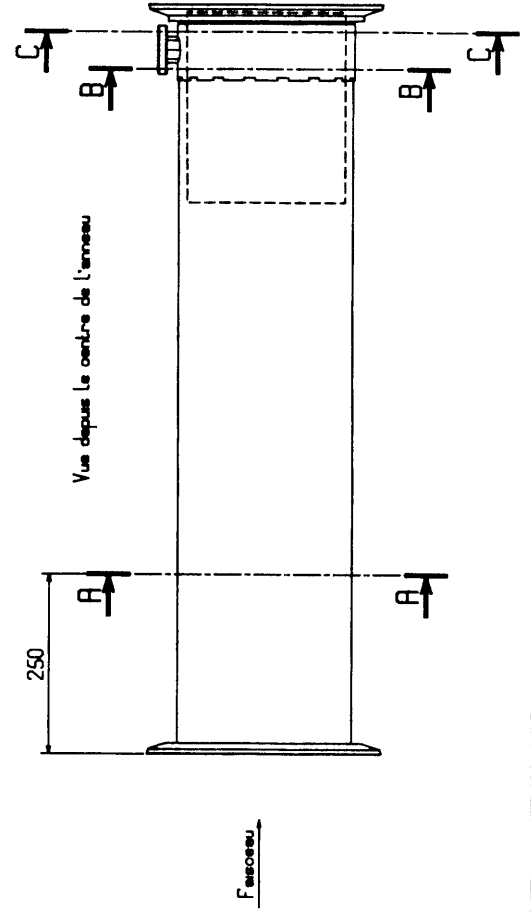
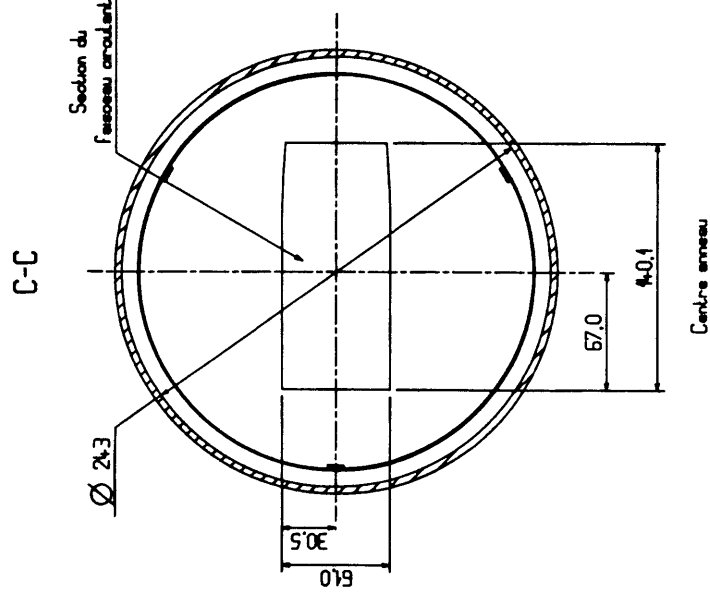
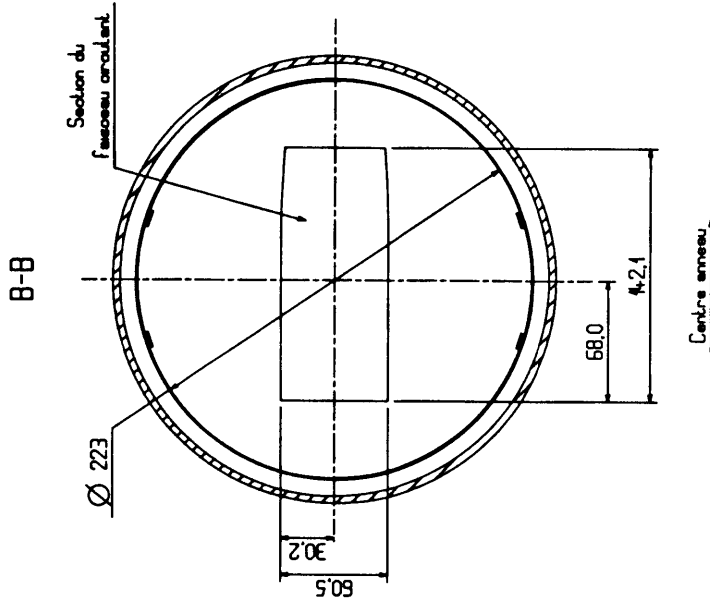
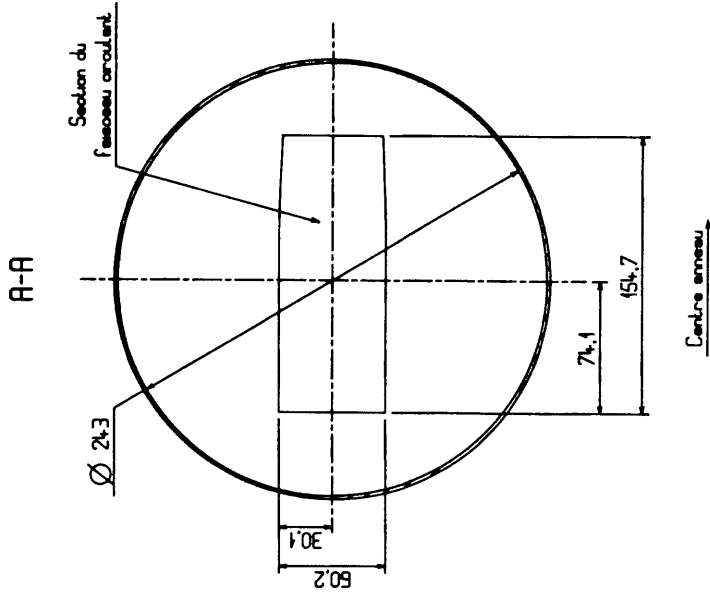
Vue depuis le centre de l'anneau



Beam dimensions inside the quadrupoles  
of the AC ring 10

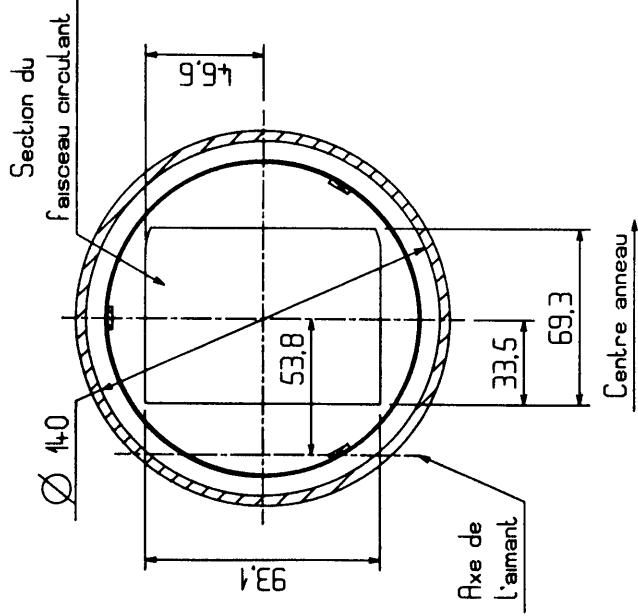


Beam dimensions inside the quadrupoles  
of the AC ring

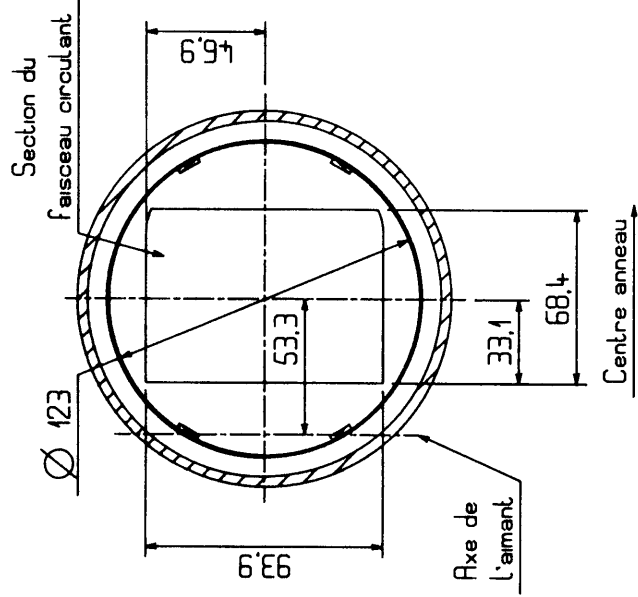


Beam dimensions inside the quadrupoles  
of the AC ring 12

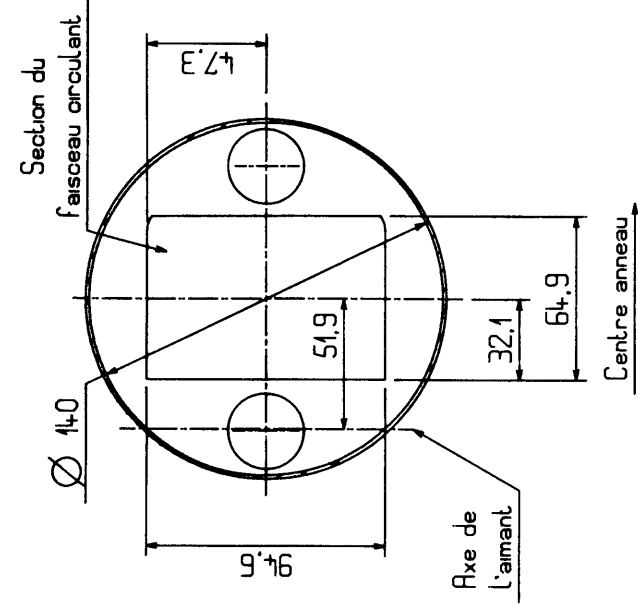
A-A



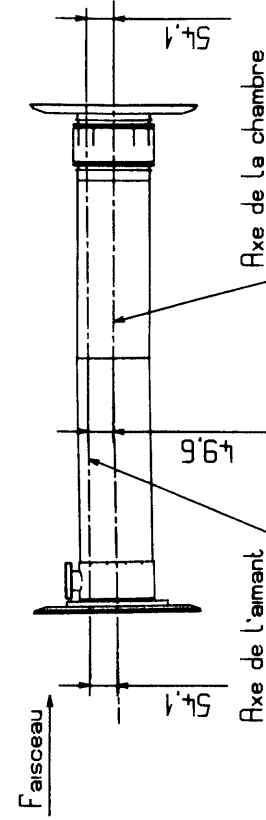
B-B



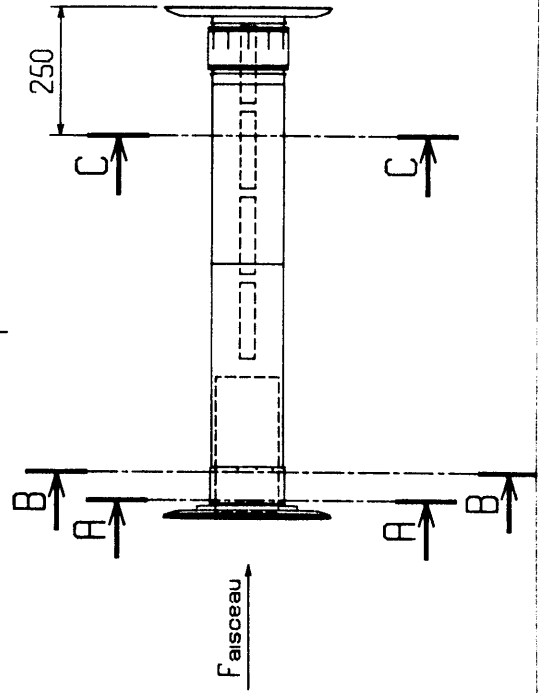
C-C



Vue de dessus

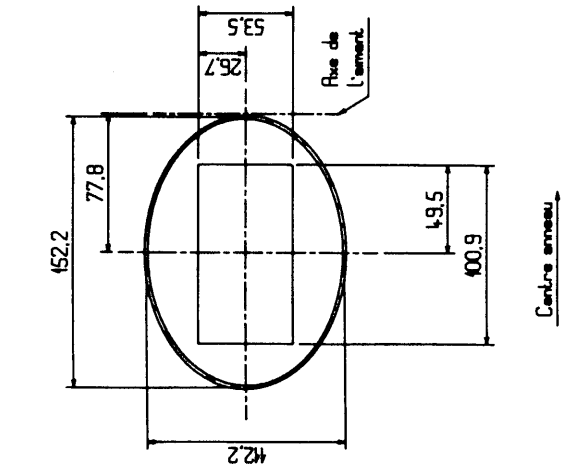


Vue depuis le centre de l'anneau

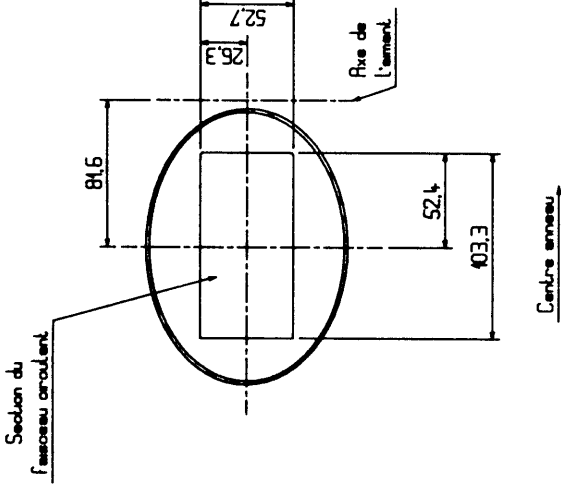


Beam dimensions inside the quadrupoles  
of the AC ring

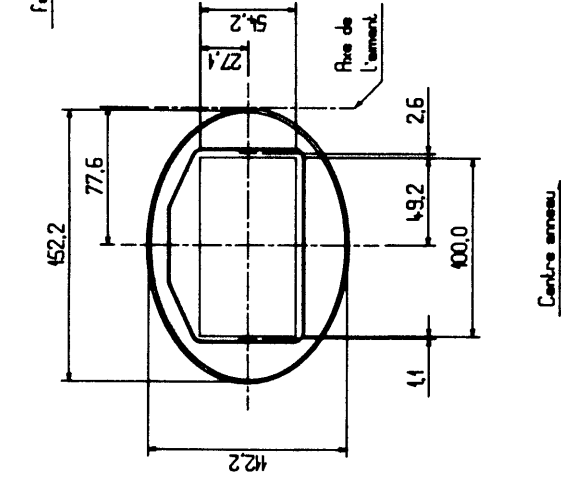
A-A



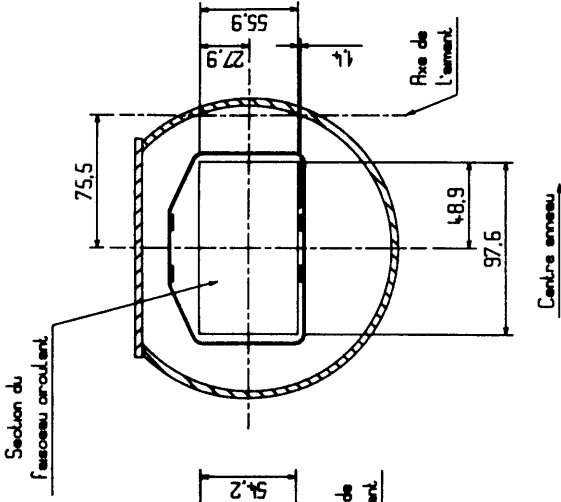
B-B



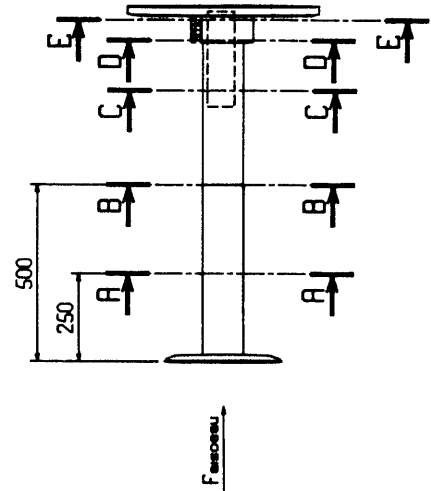
C-C



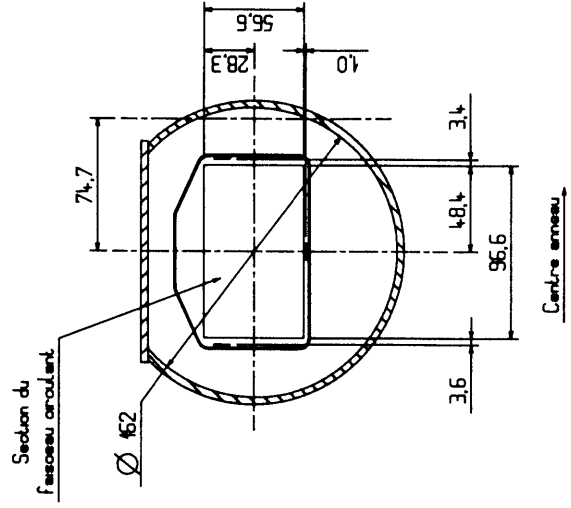
D-D



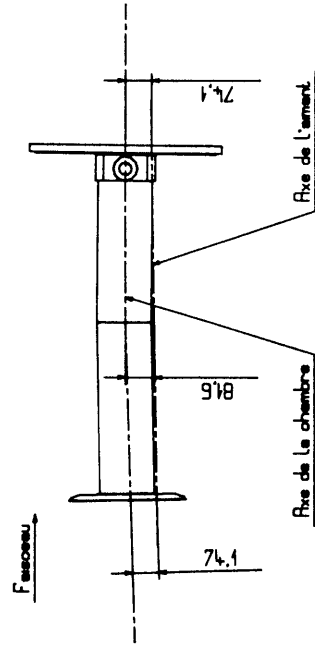
Vue depuis le centre de l'anneau



E-E

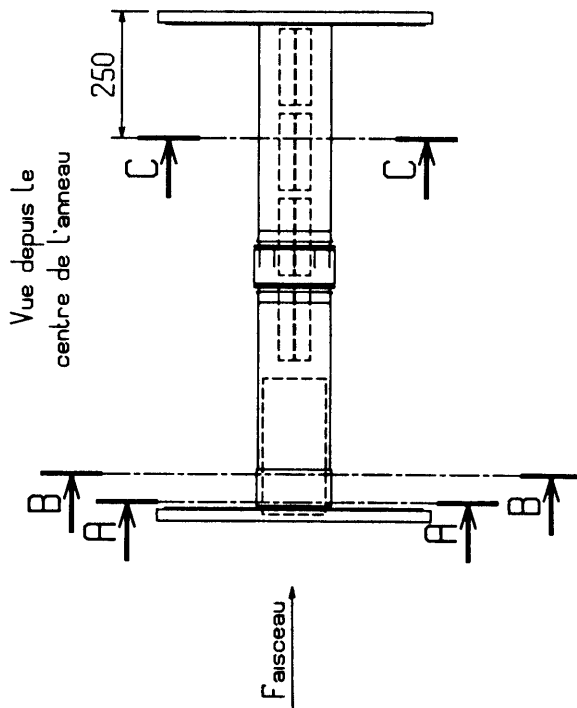
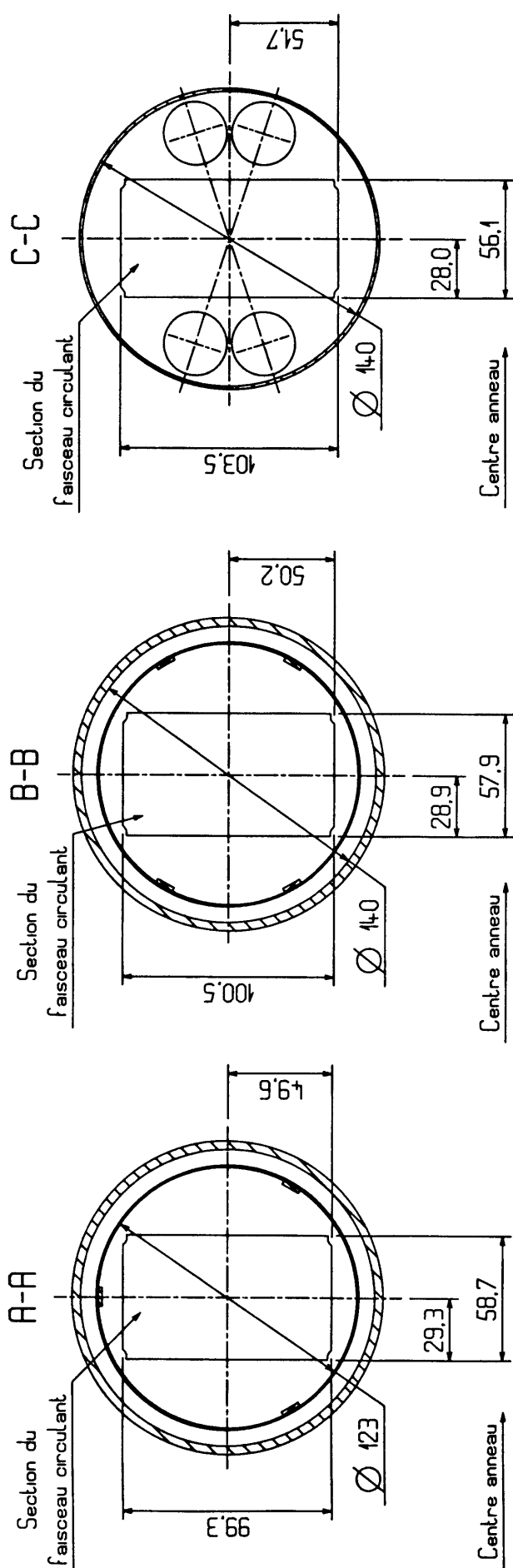


Vue de dessus

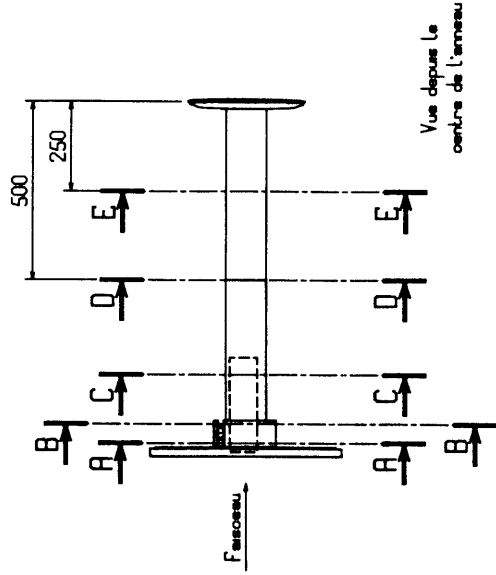
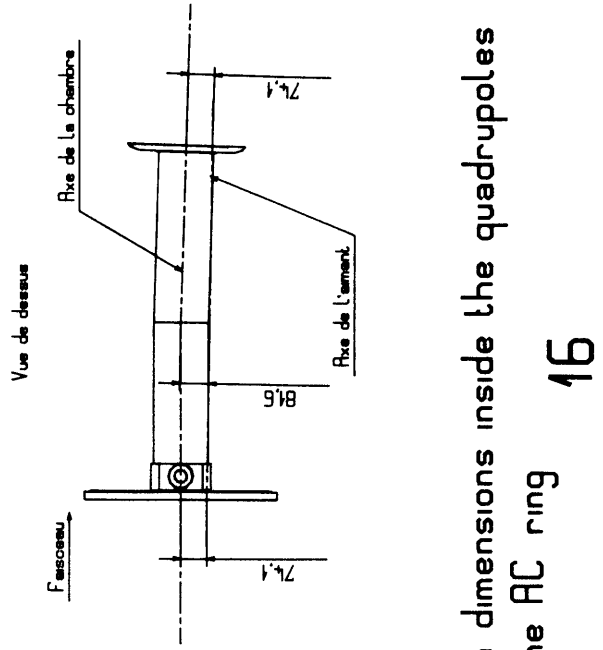
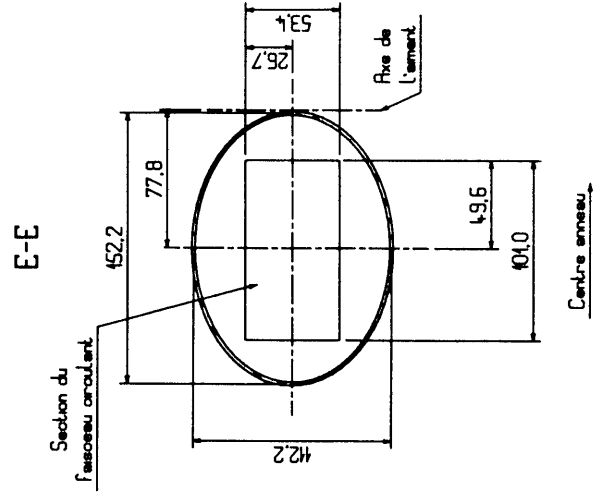
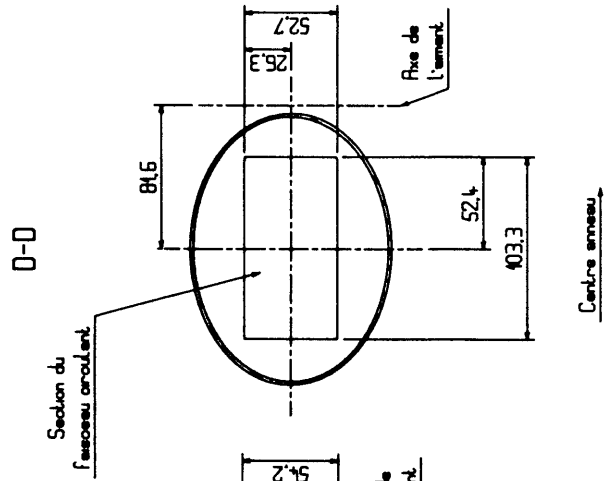
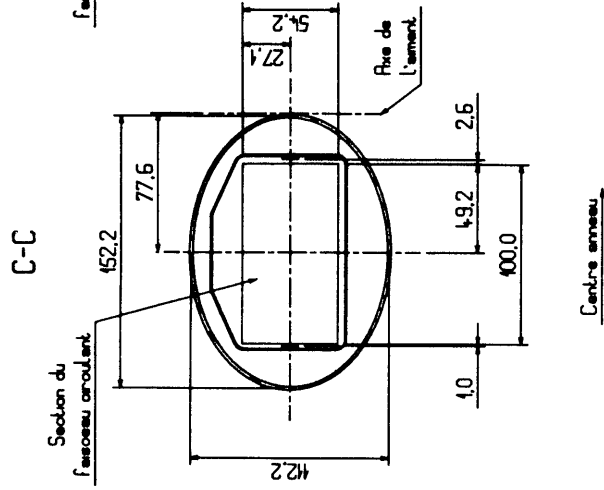
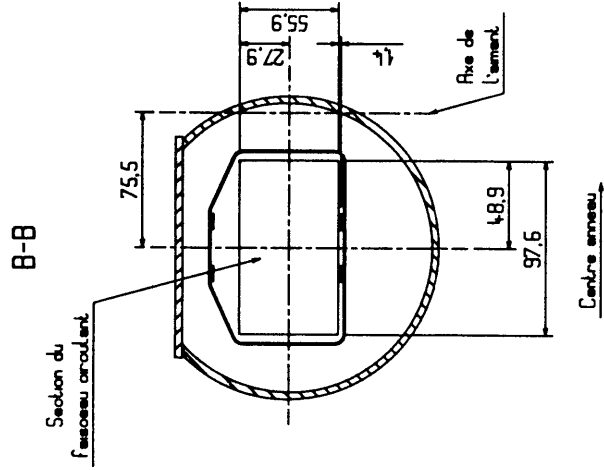
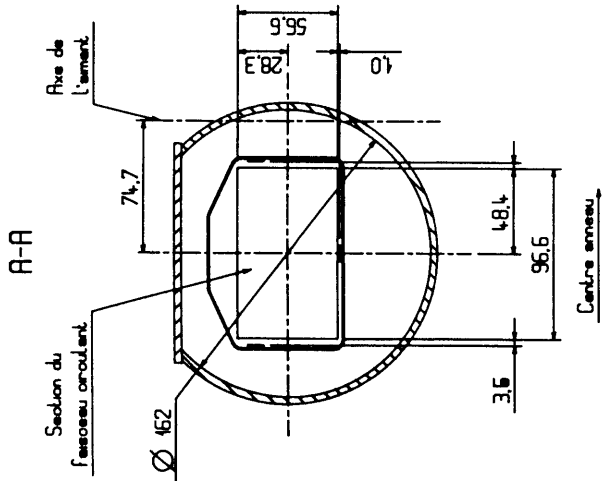


Beam dimensions inside the quadrupoles of the AC ring

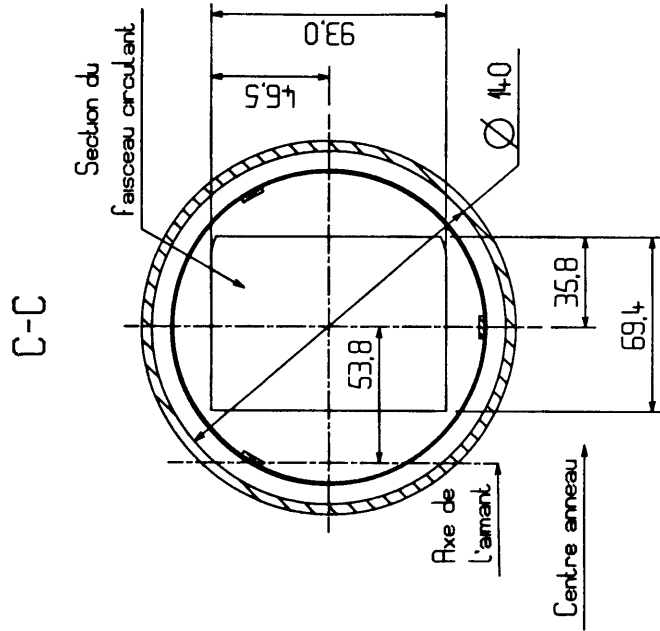
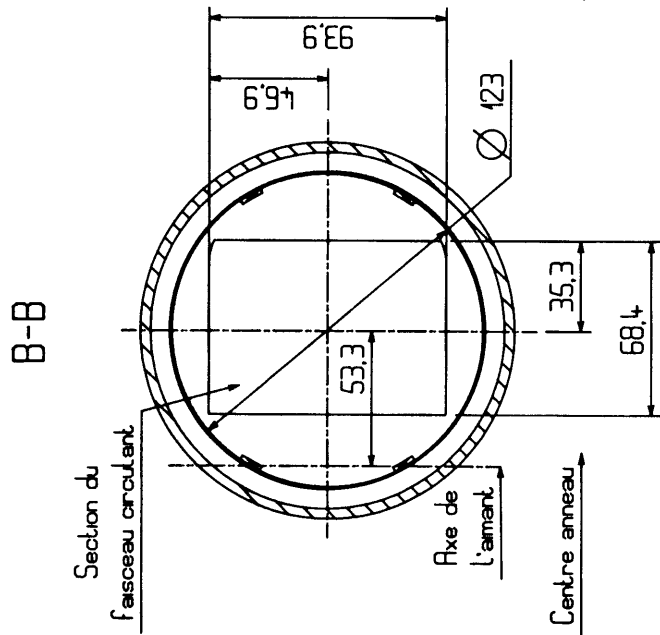
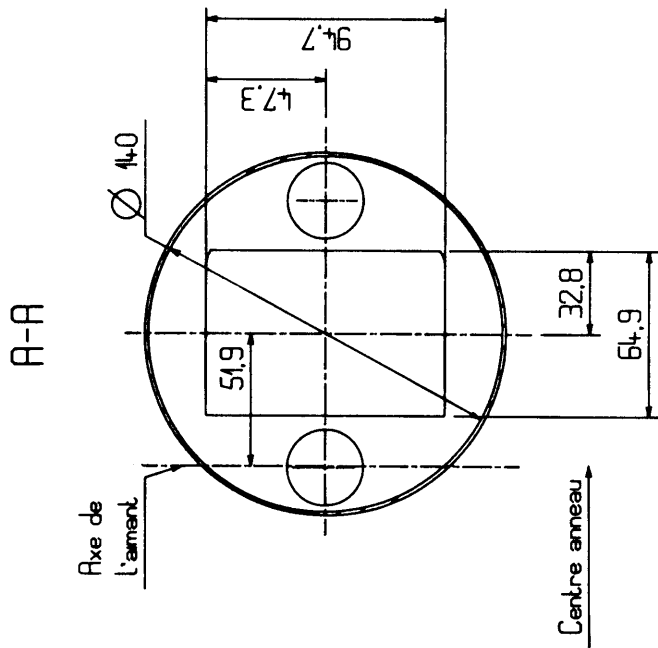




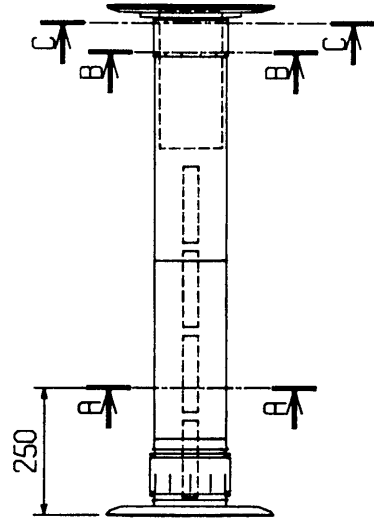
Beam dimensions inside the quadrupoles  
of the AC ring



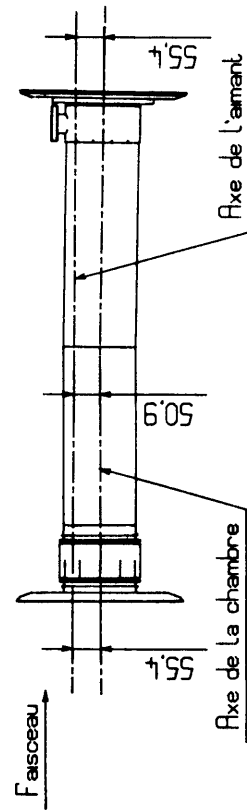
Beam dimensions inside the quadrupoles  
of the AC ring **16**



Vue depuis le centre de l'anneau

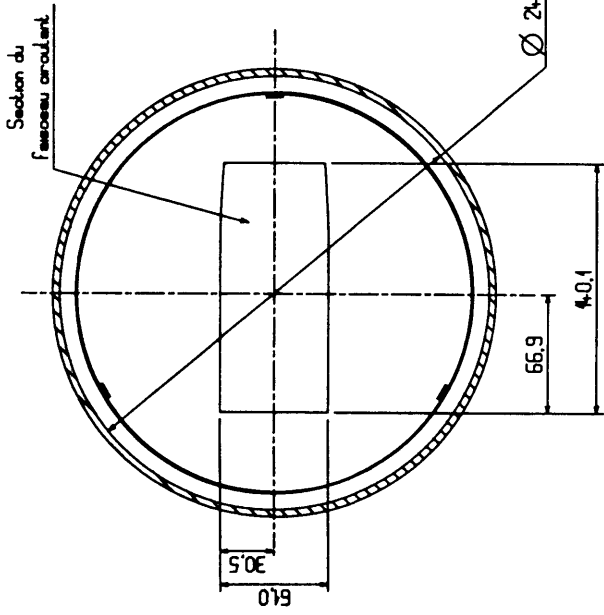


Vue de dessus

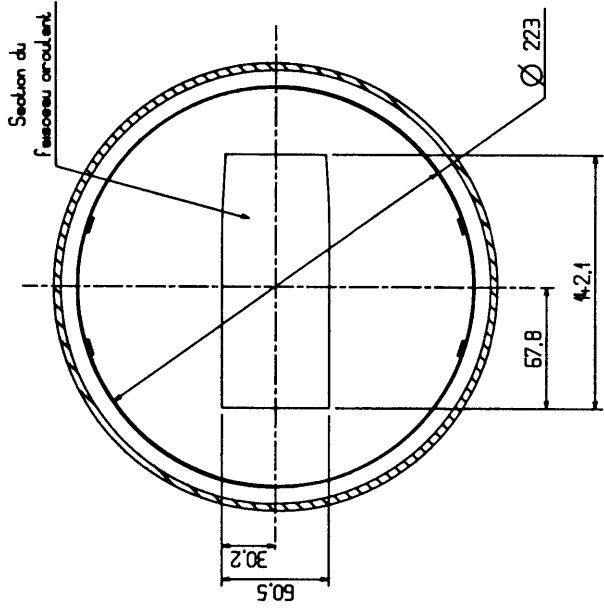


Beam dimensions inside the quadrupoles  
of the AC ring

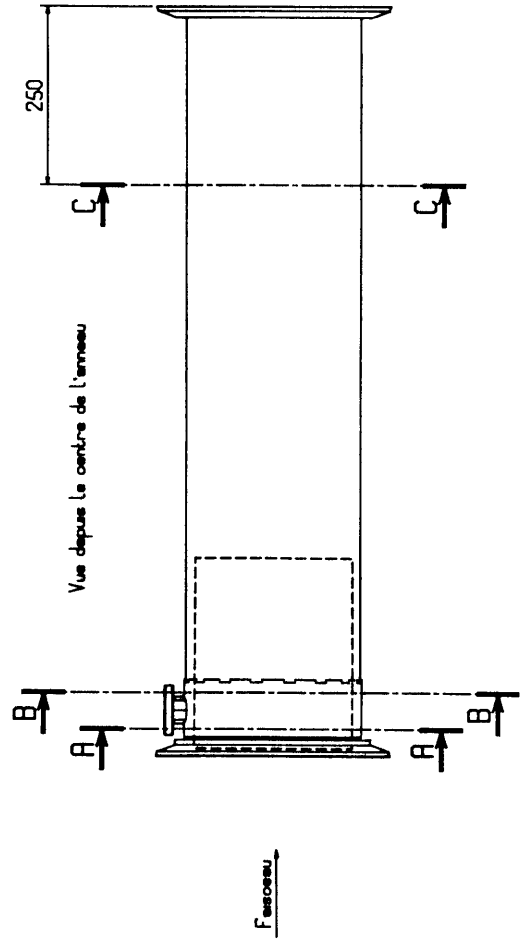
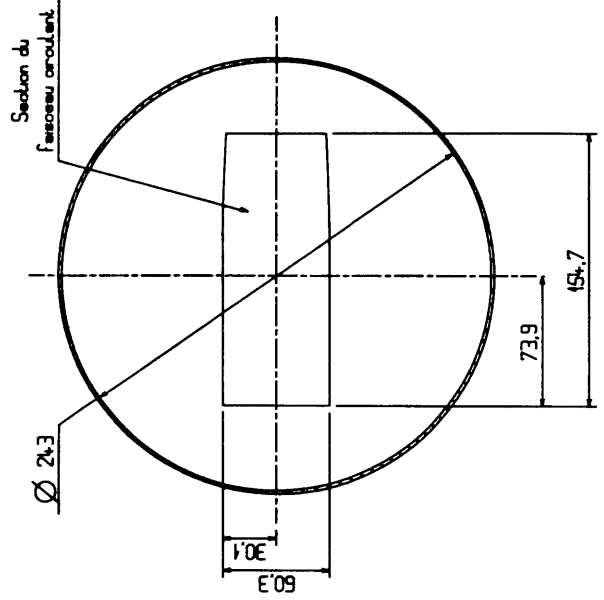
A-A



B-B

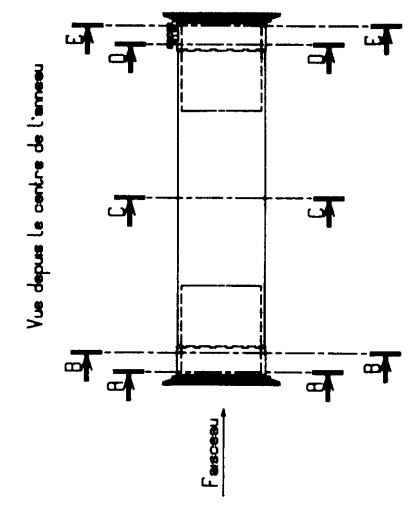
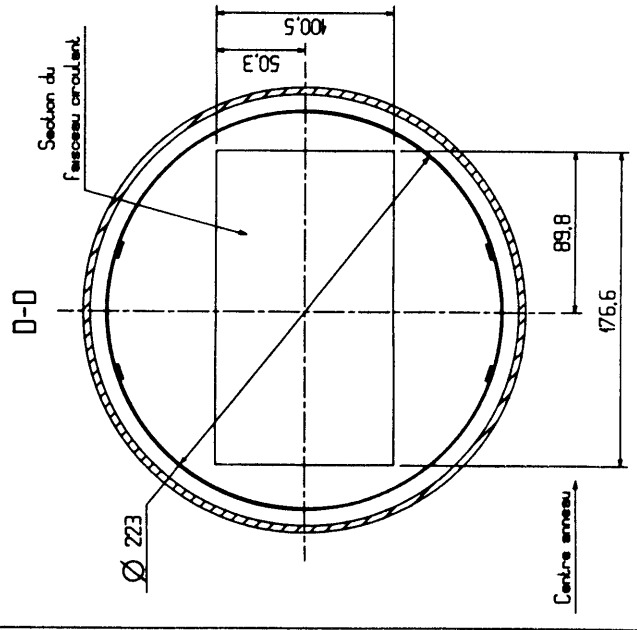
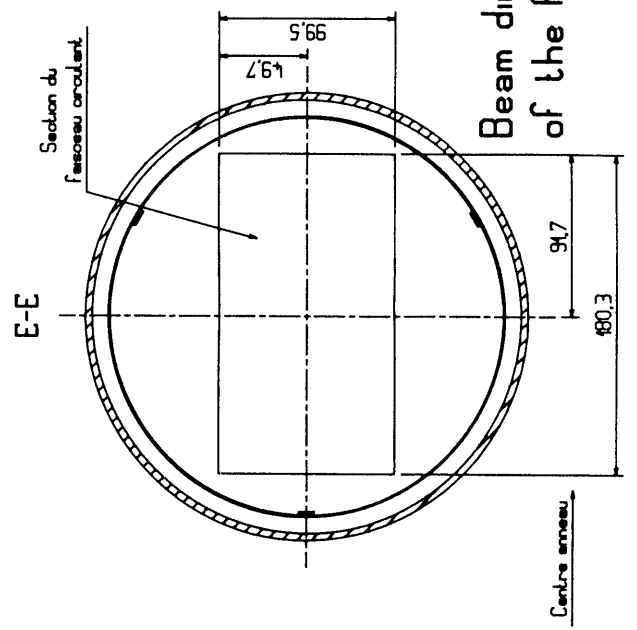
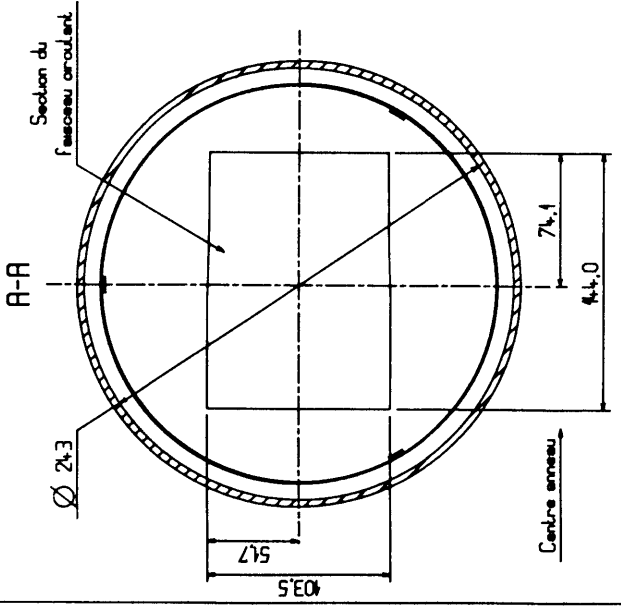
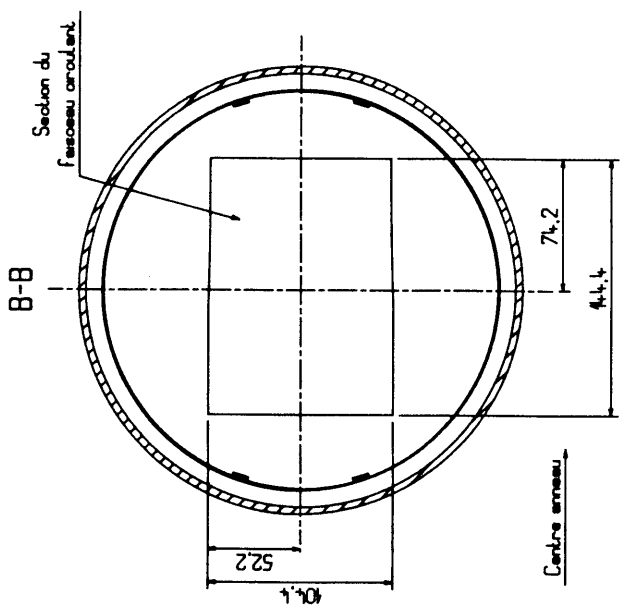
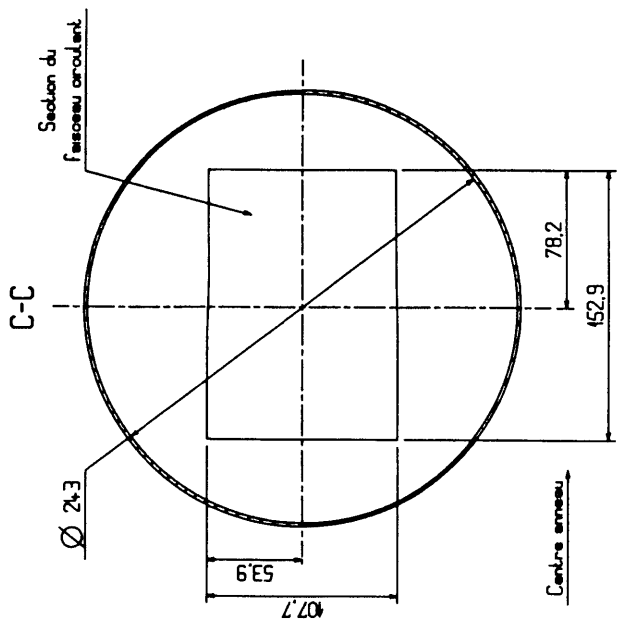


C-C

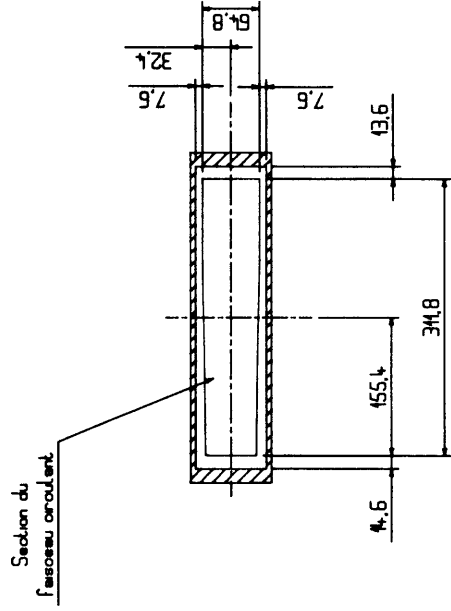


Beam dimensions inside the quadrupoles  
of the AC ring

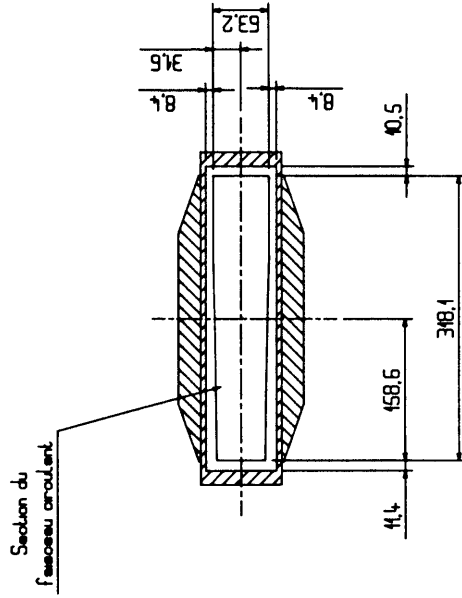
Beam dimensions inside the quadrupoles  
of the AC ring 19



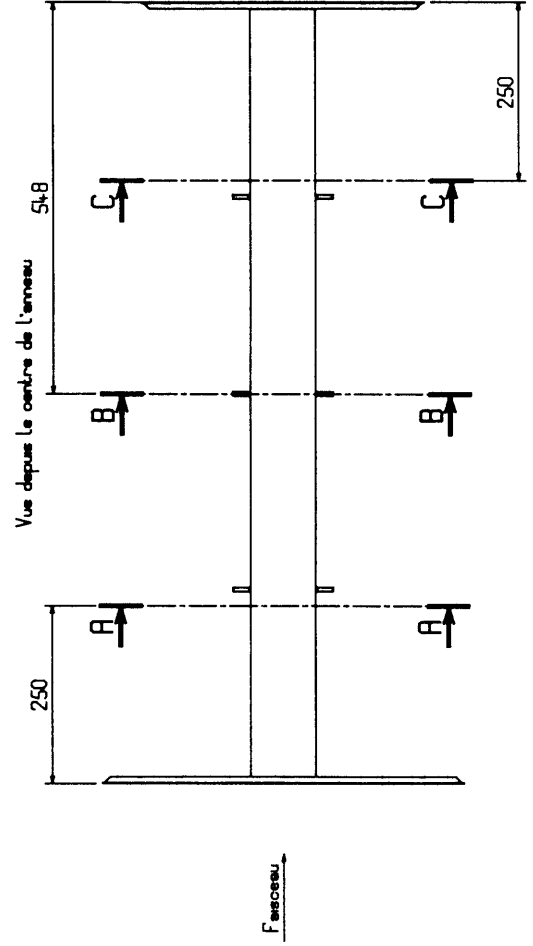
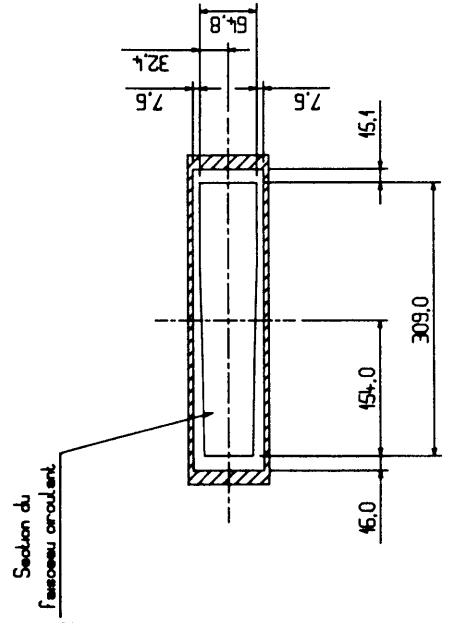
A-A



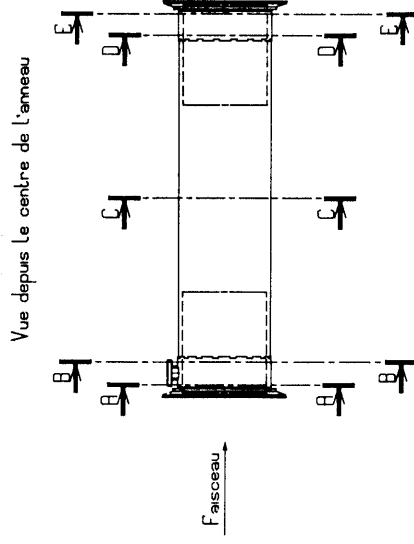
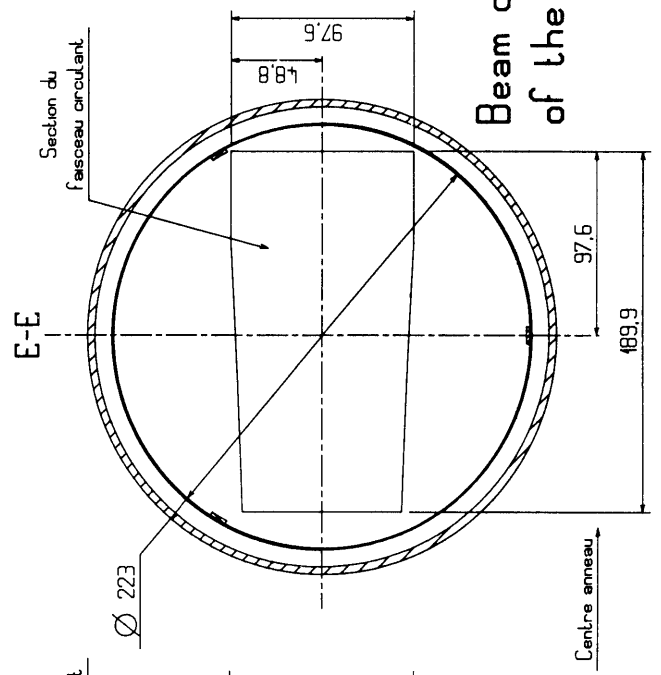
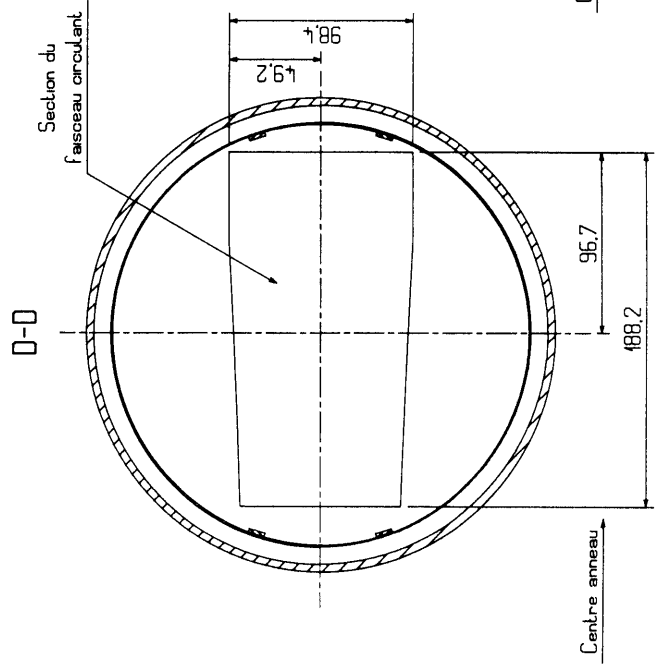
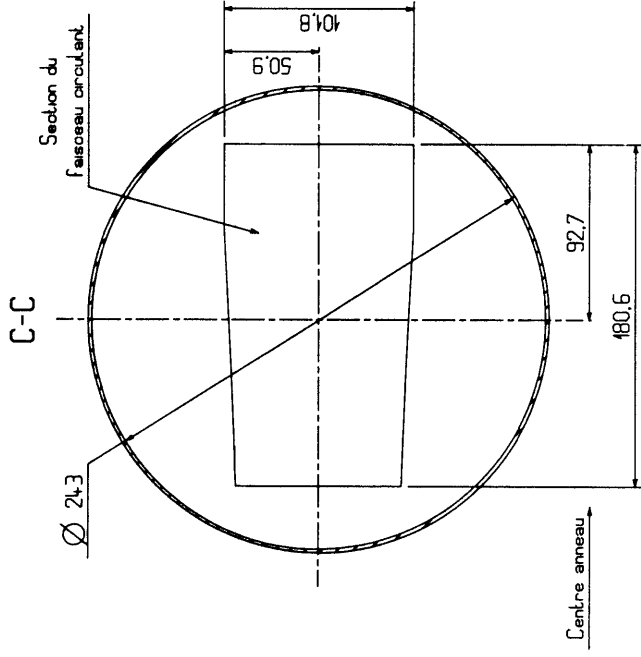
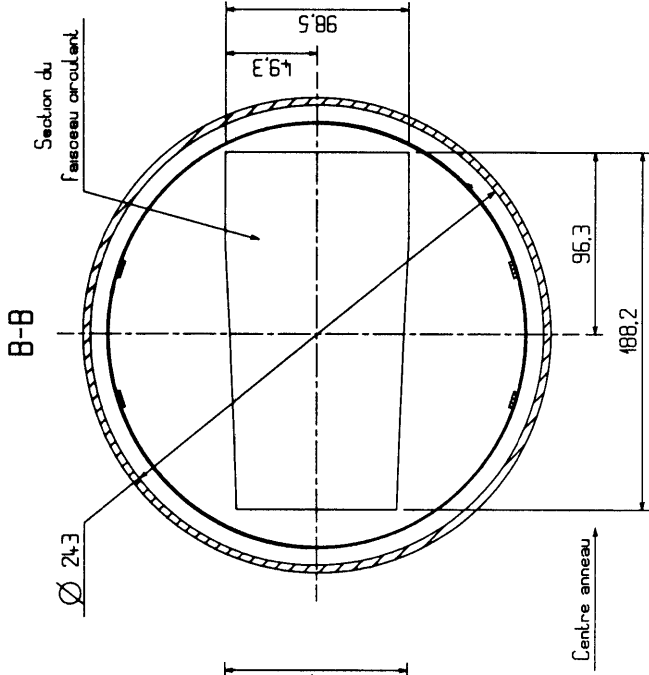
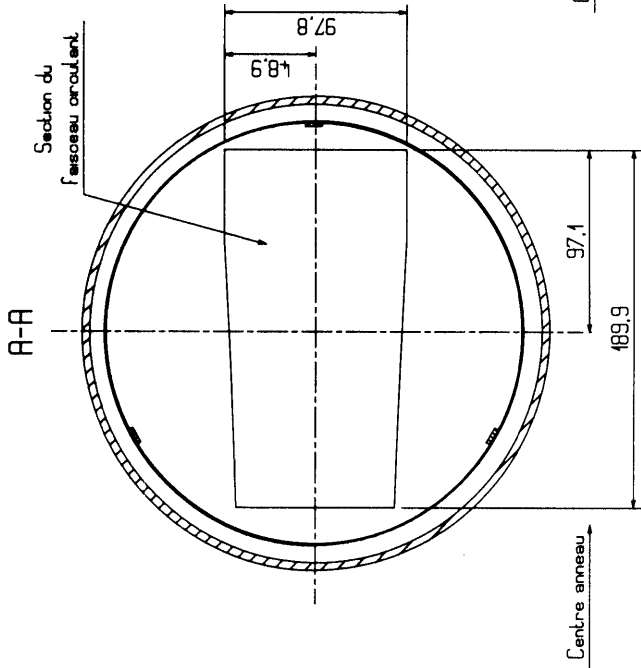
B-B



C-C



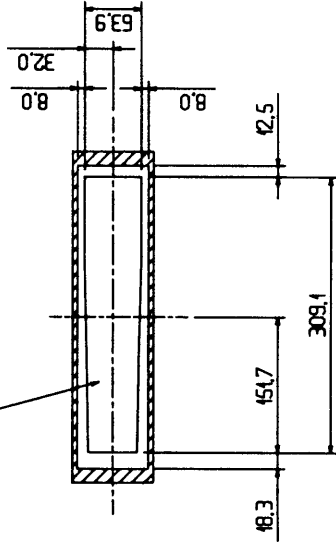
Beam dimensions inside the quadrupoles  
of the AC ring 20



Beam dimensions inside the quadrupoles  
of the AC ring 21

A-A

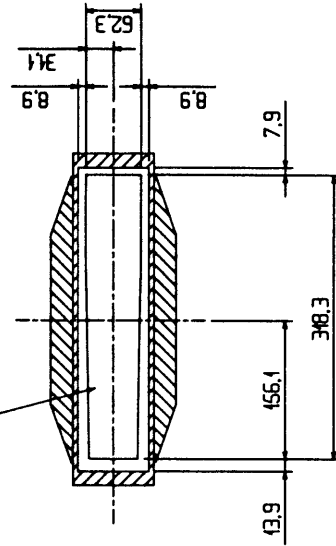
Section du faisceau arroulant



Centre anneau

B-B

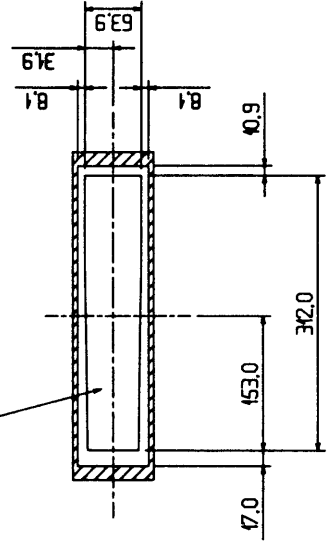
Section du faisceau arroulant



Centre anneau

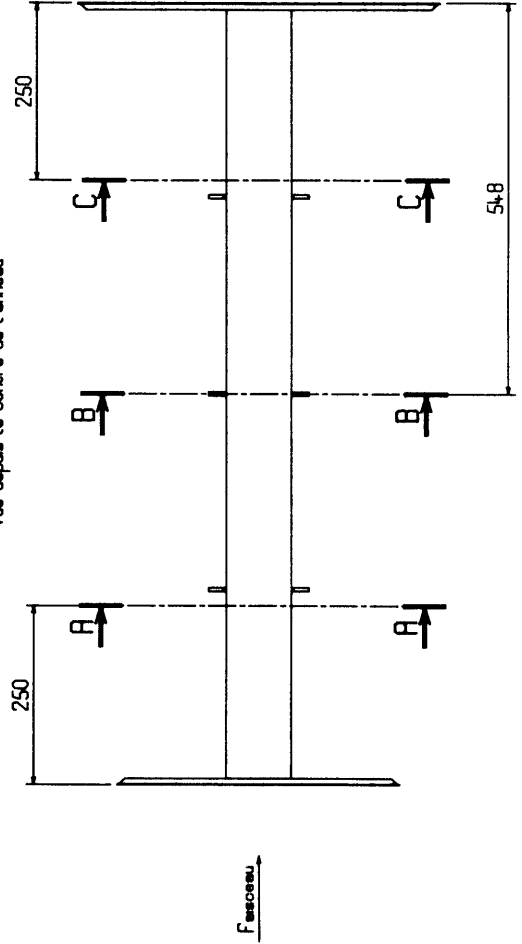
C-C

Section du faisceau arroulant



Centre anneau

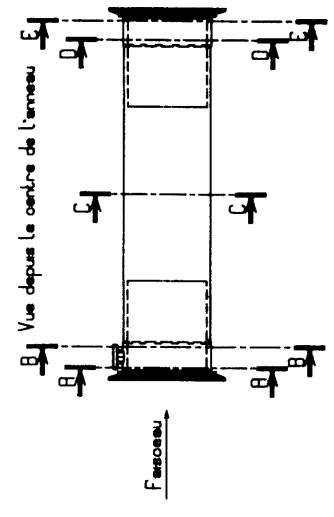
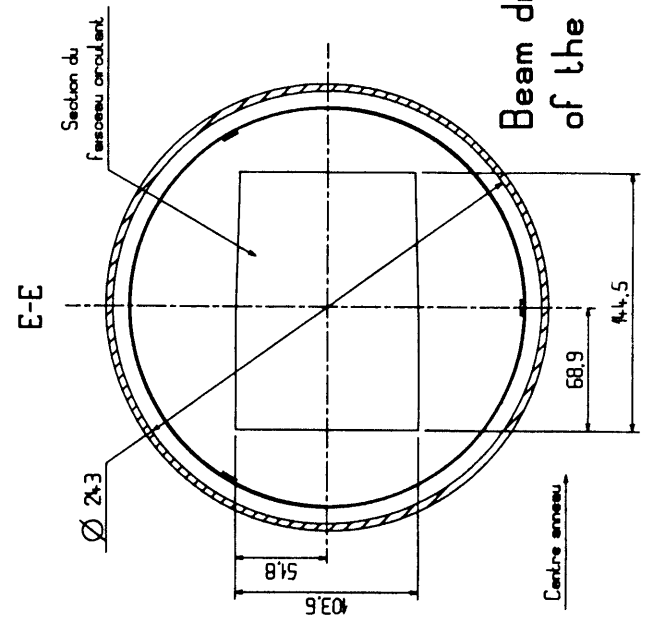
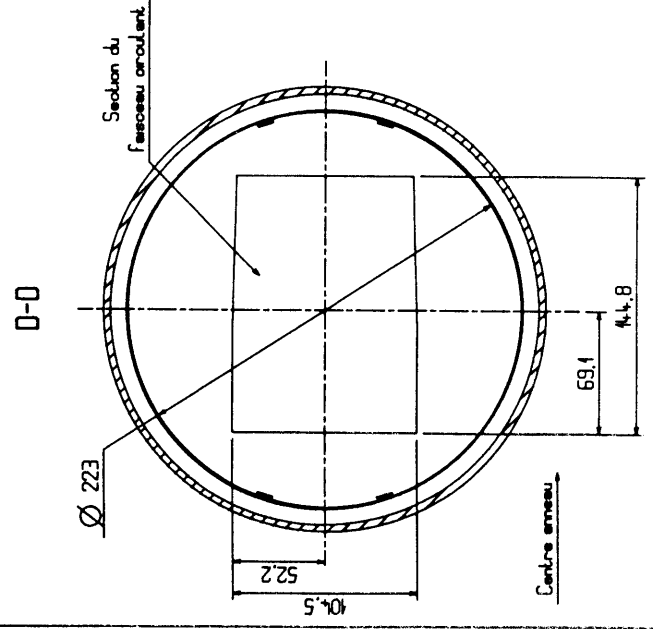
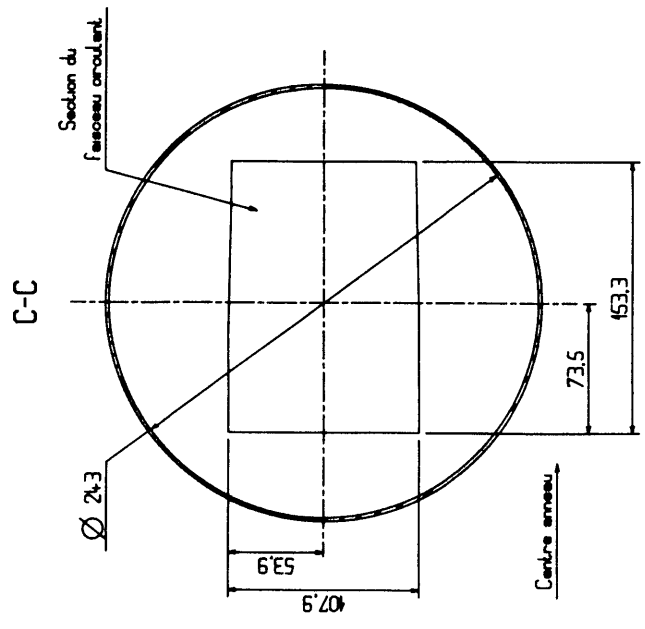
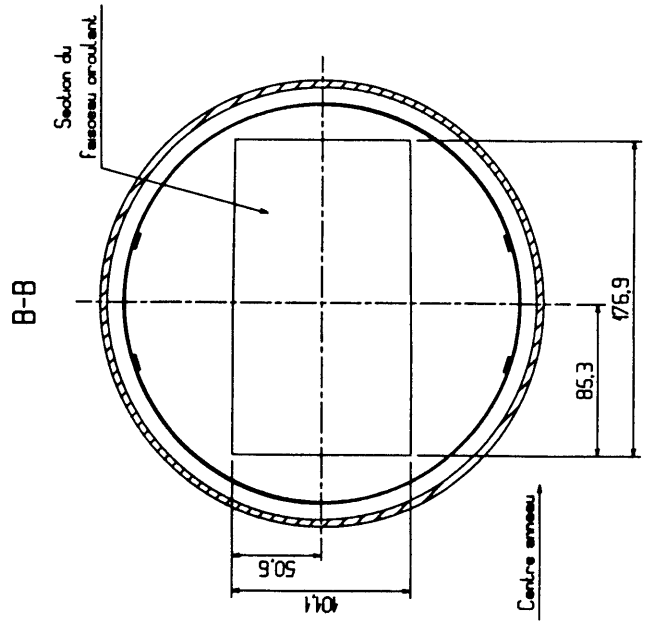
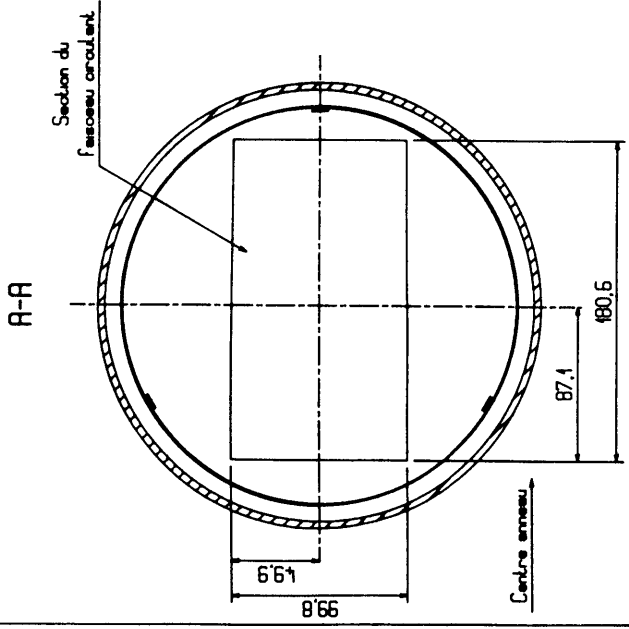
Vue depuis le centre de l'anneau



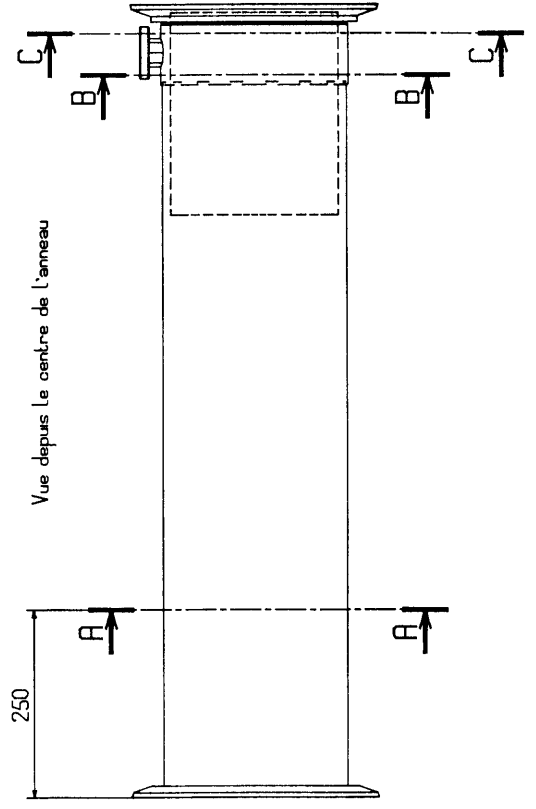
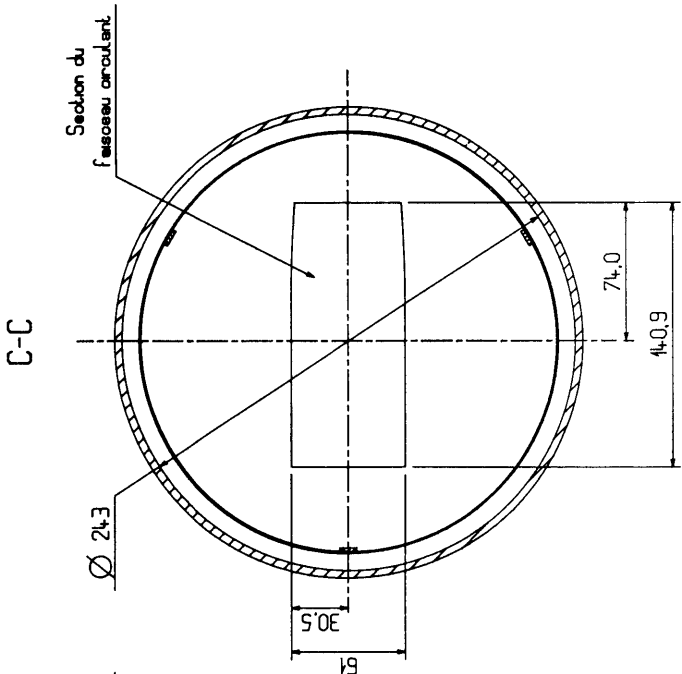
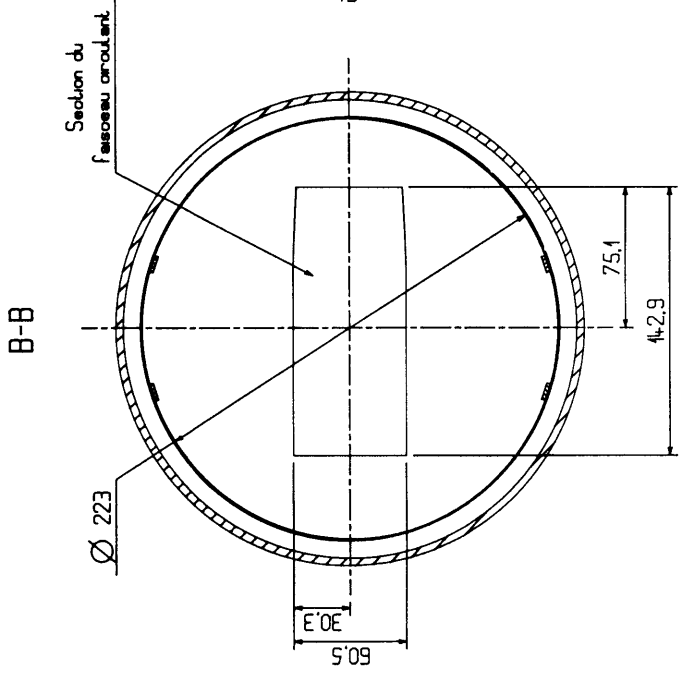
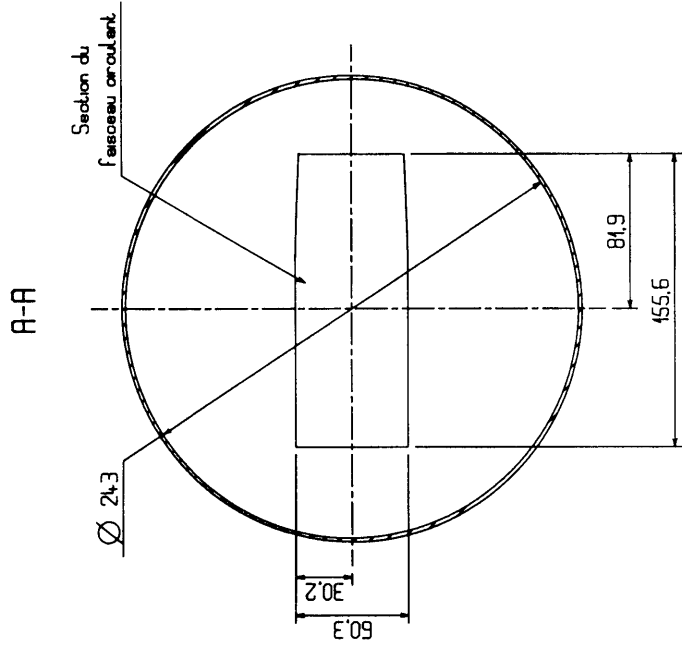
Faisceau

Beam dimensions inside the quadrupoles  
of the AC ring 22



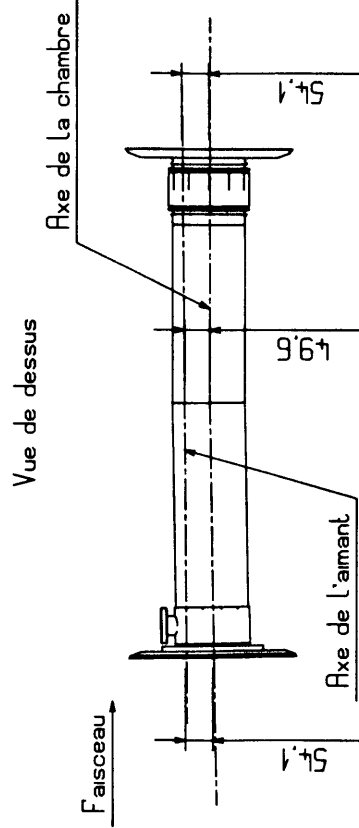
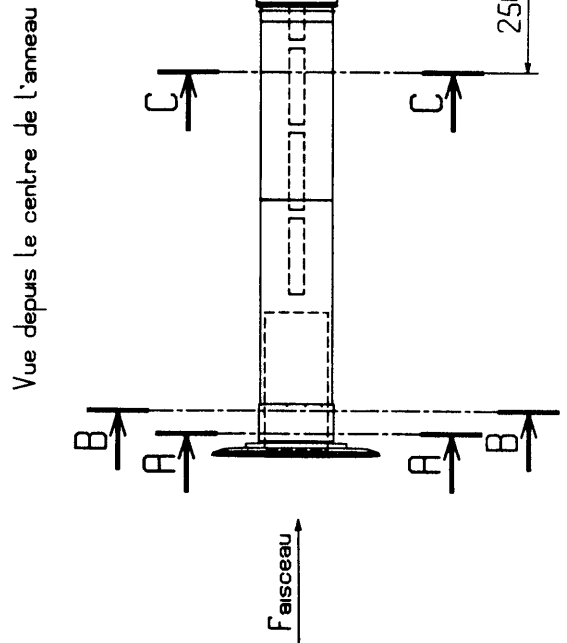
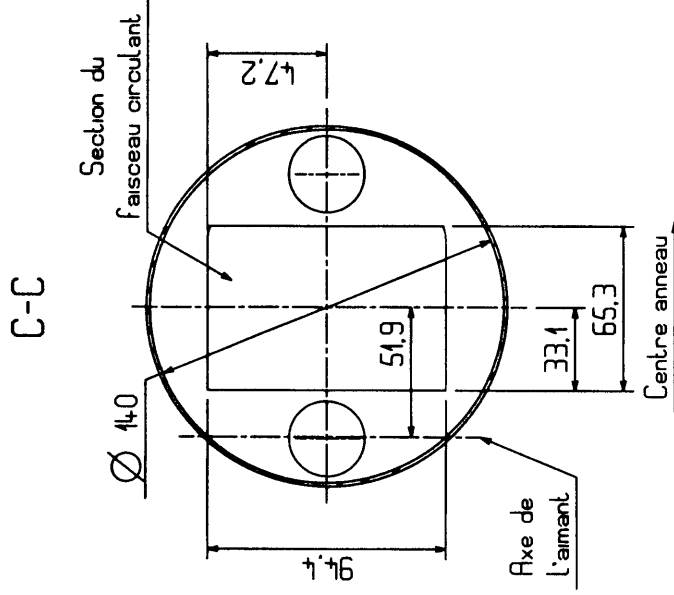
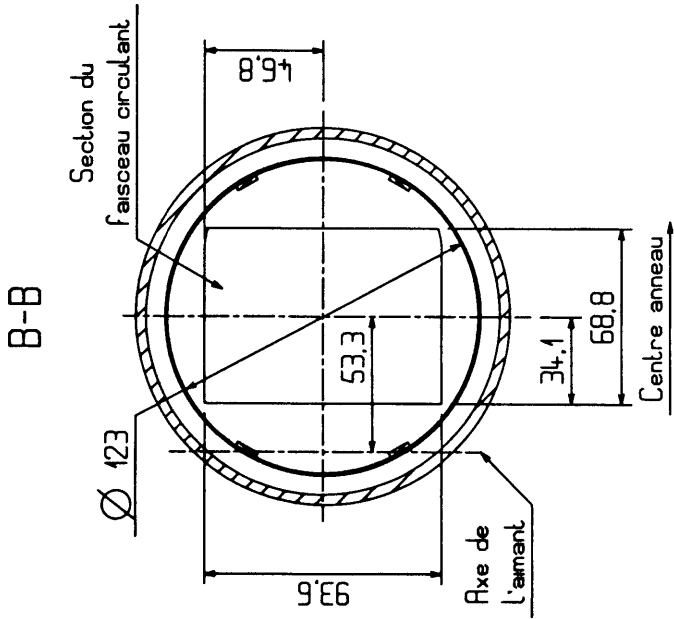
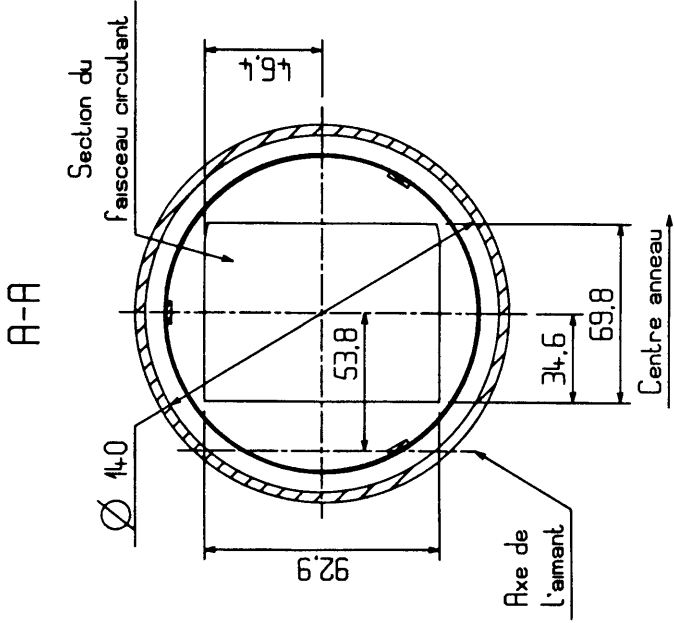


Beam dimensions inside the quadrupoles  
of the AC ring 23

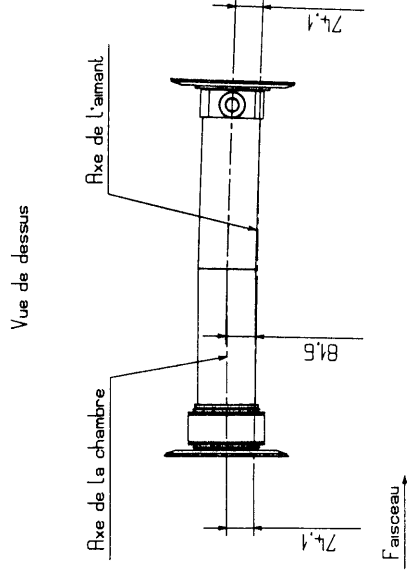
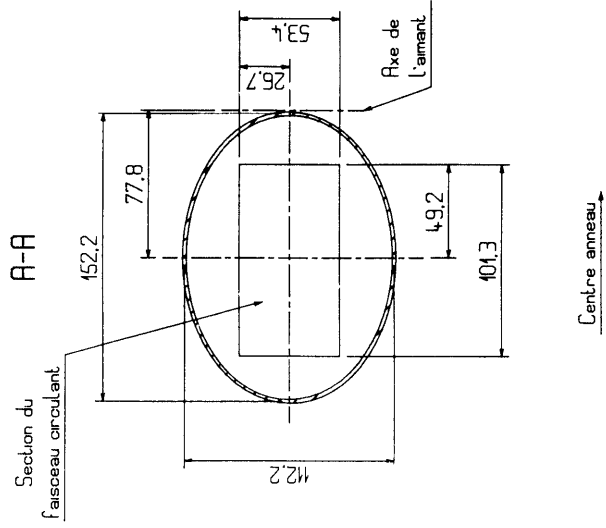
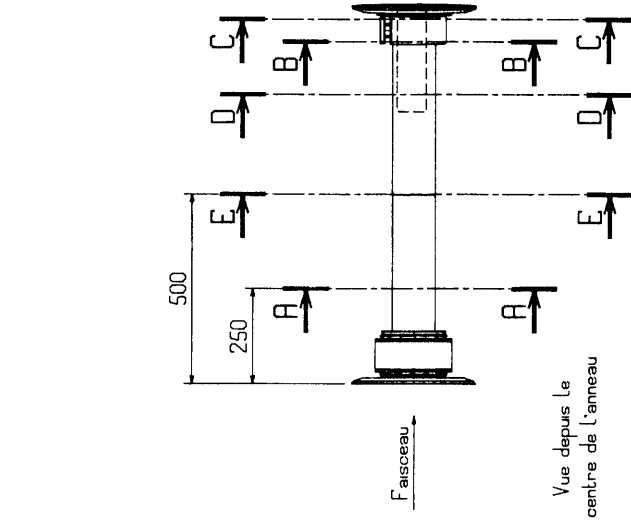
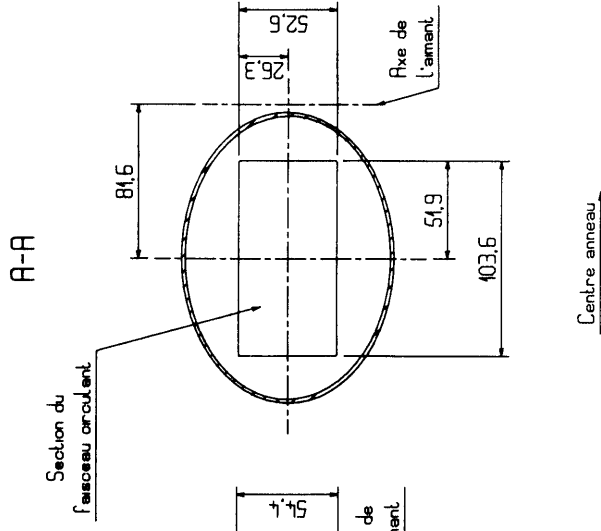
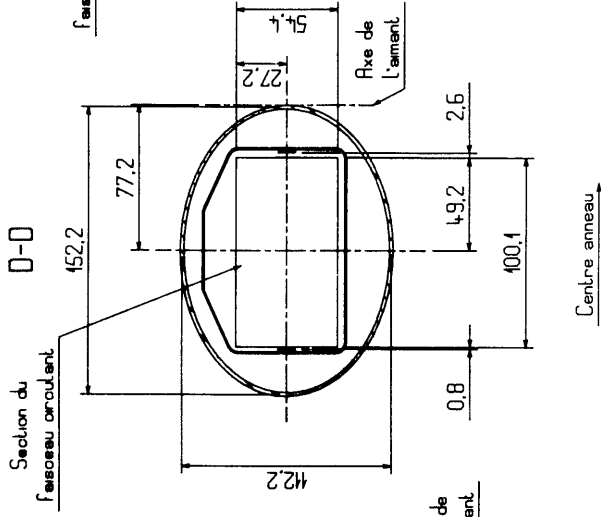
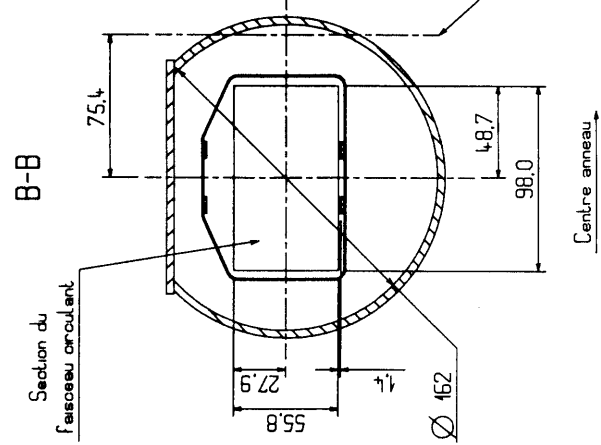
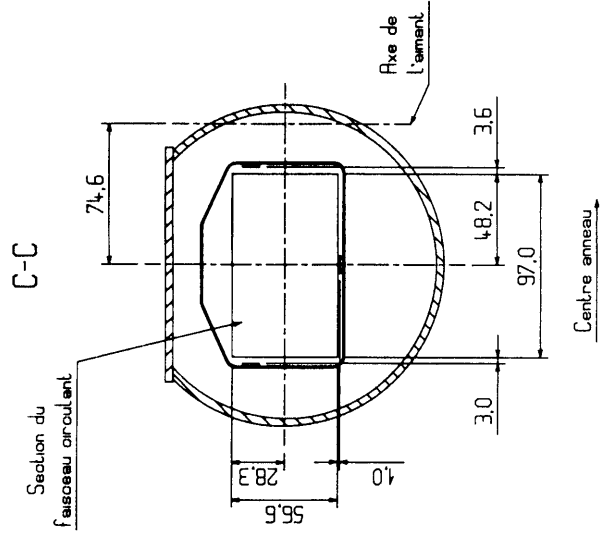


FRASCERU

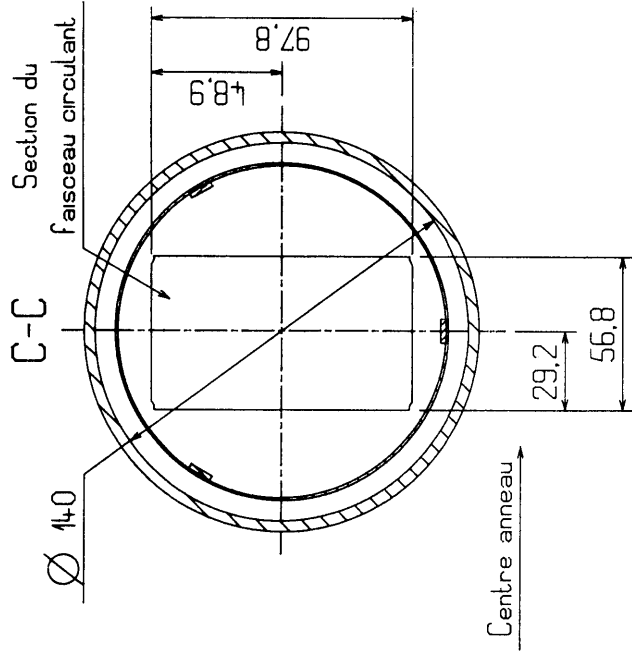
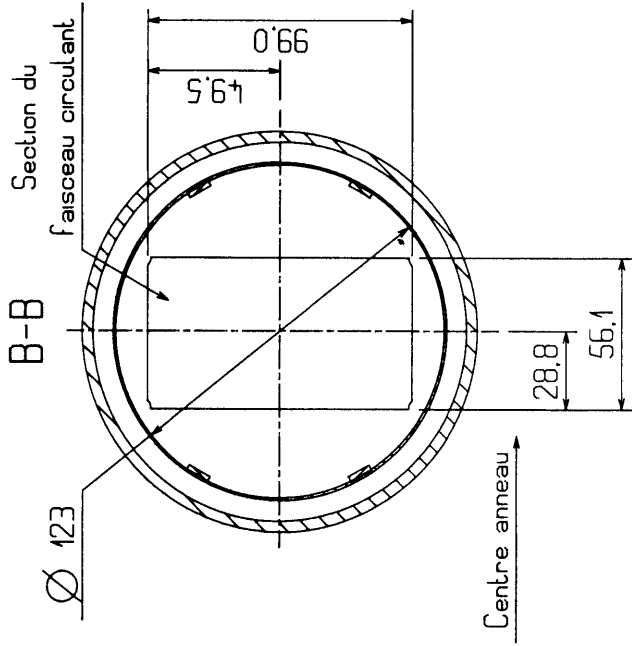
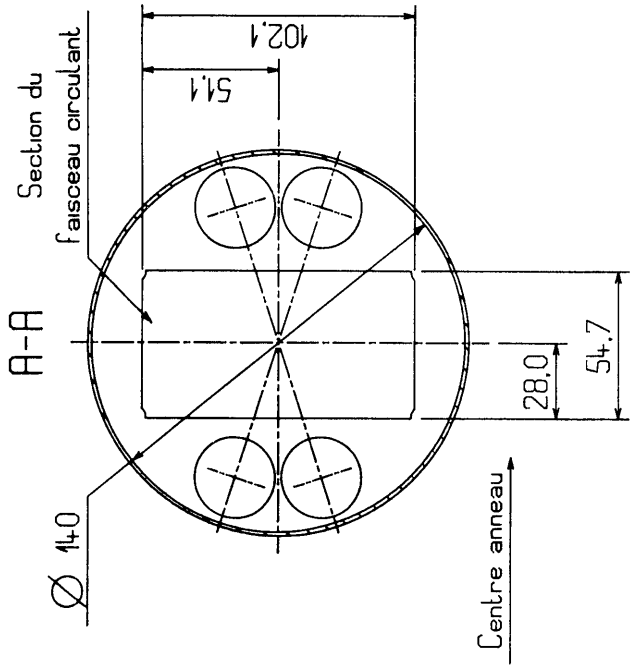
Beam dimensions inside the quadrupoles  
of the AC ring **24**



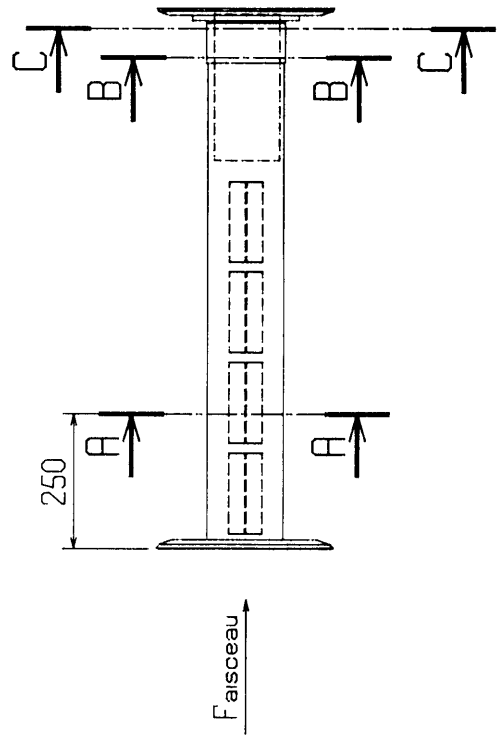
Beam dimensions inside the quadrupoles  
of the AC ring



Beam dimensions inside the quadrupoles  
of the AC ring **26**

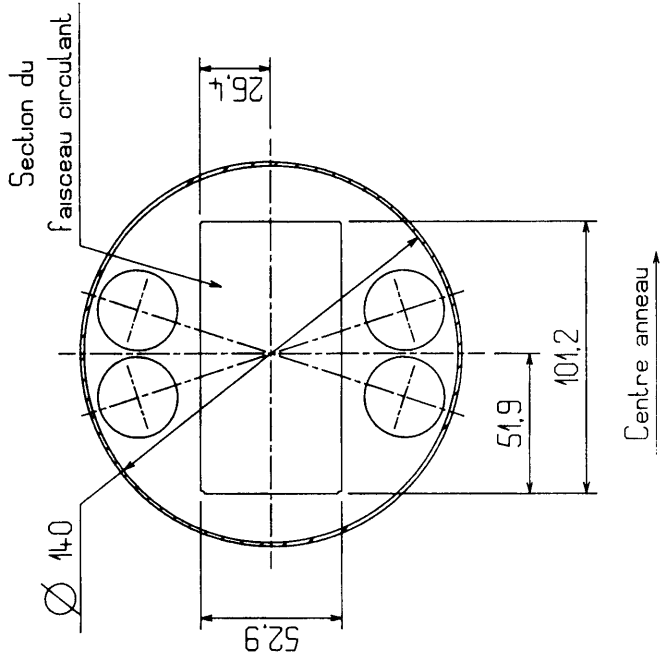


Vue depuis le centre de l'anneau

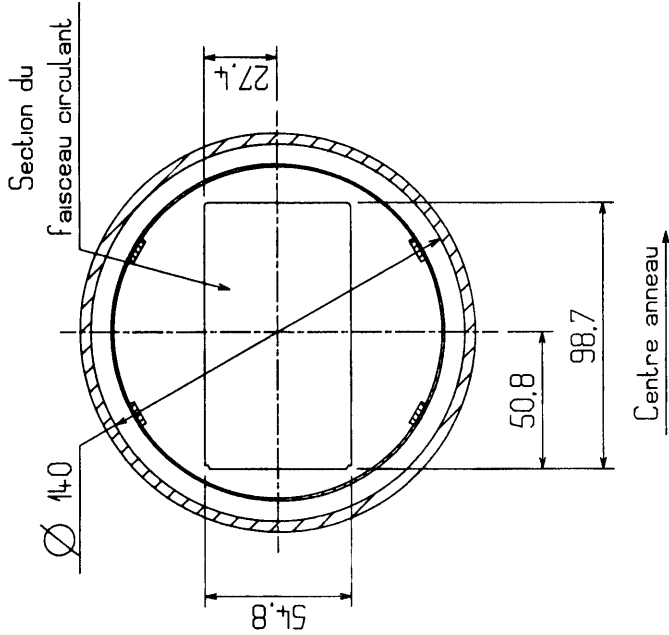


Beam dimensions inside the quadrupoles  
of the AC ring 27

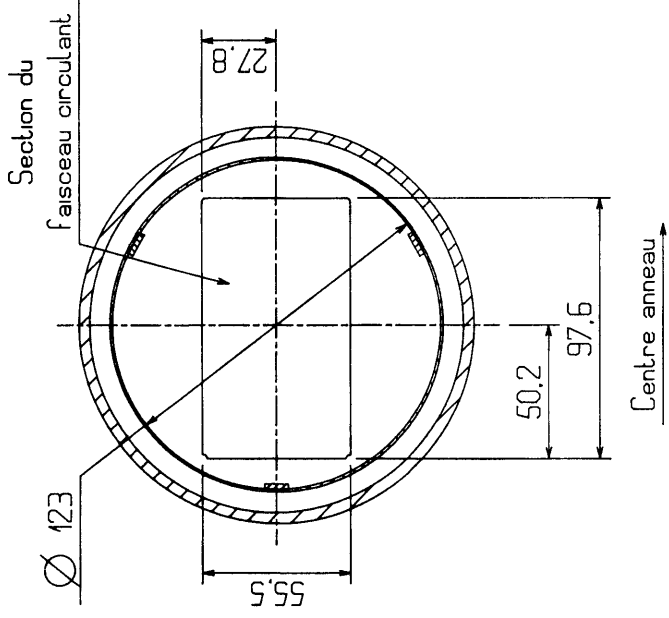
A-A



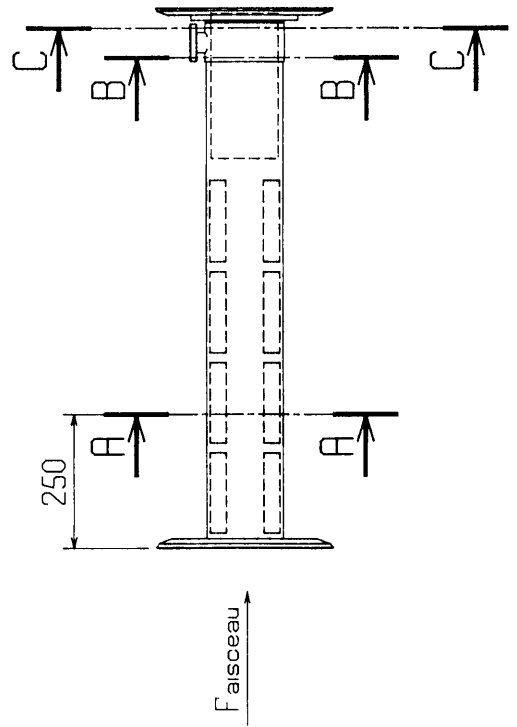
B-B



C-C

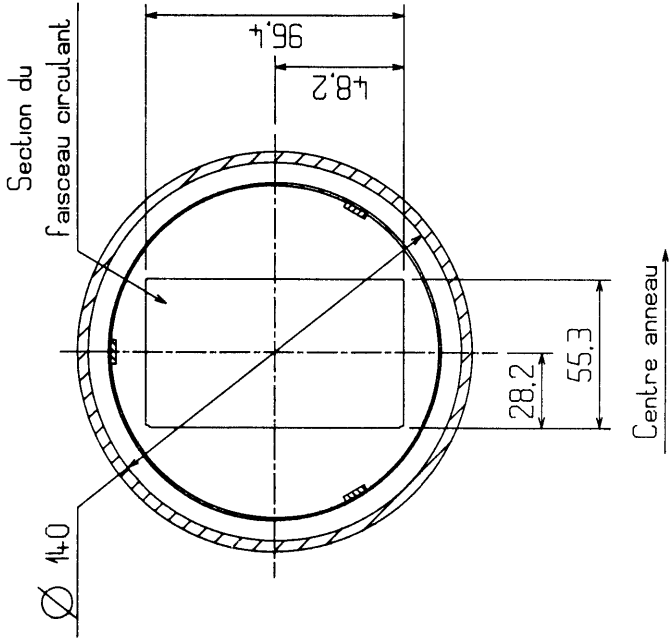


Vue depuis le centre de l'anneau

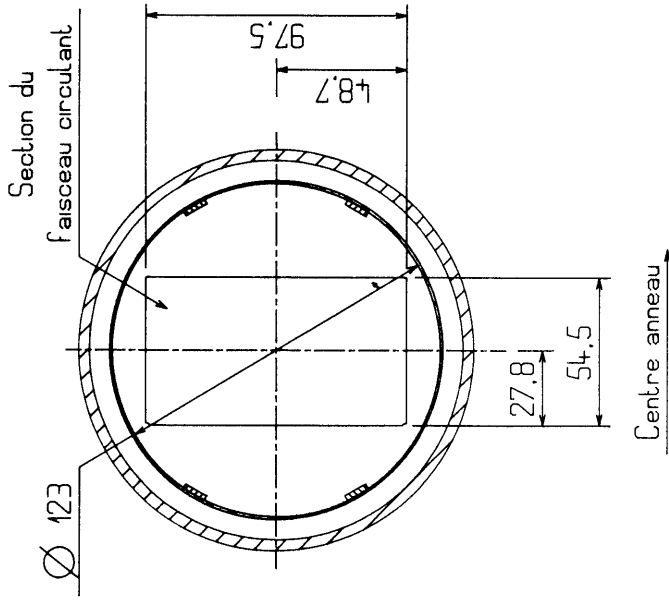


Beam dimensions inside the quadrupoles  
of the AC ring 28

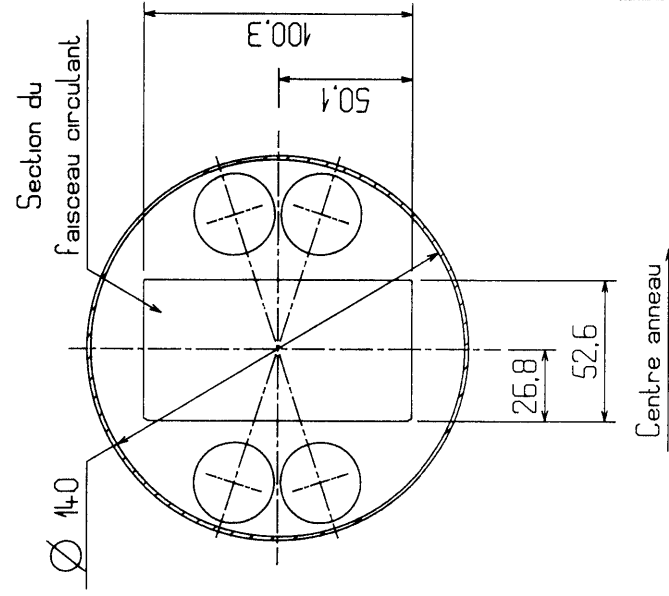
A-A



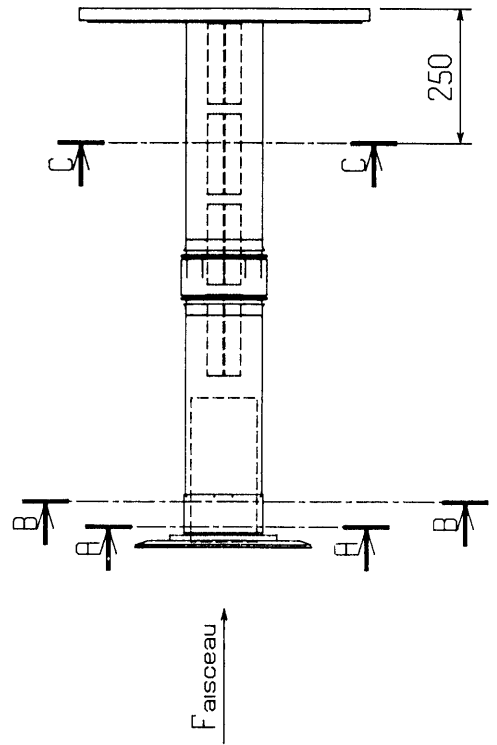
B-B



C-C

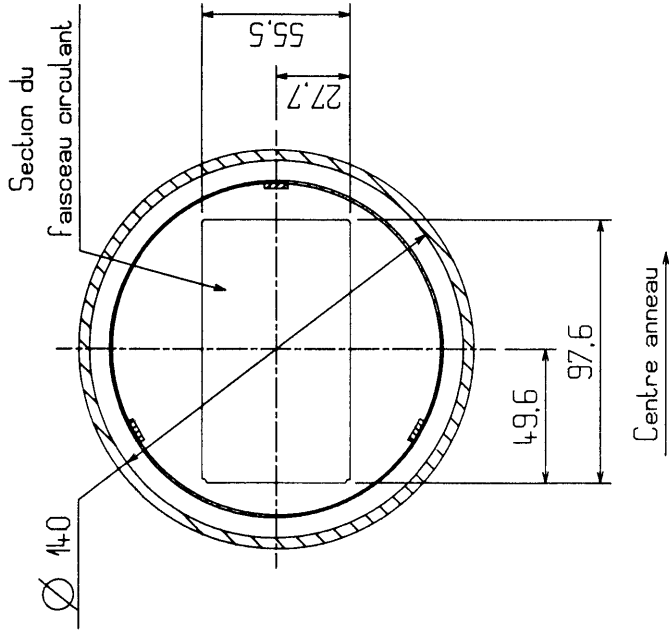


Vue depuis le centre de l'anneau

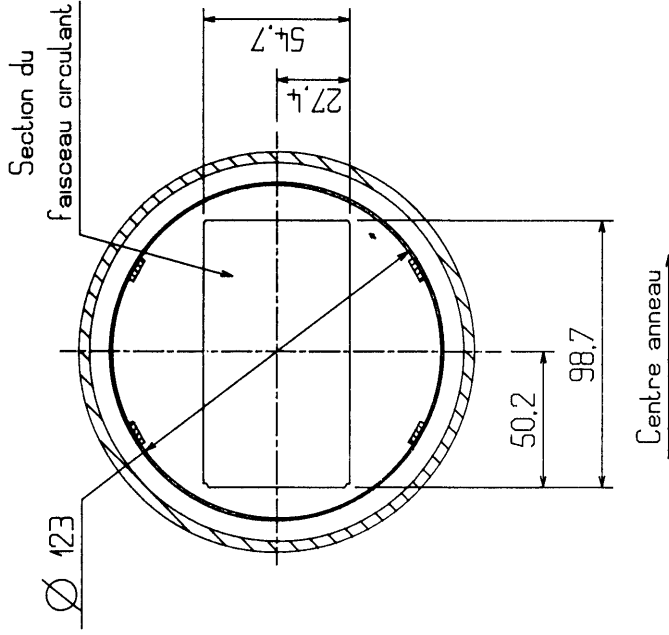


Beam dimensions inside the quadrupoles  
of the AC ring

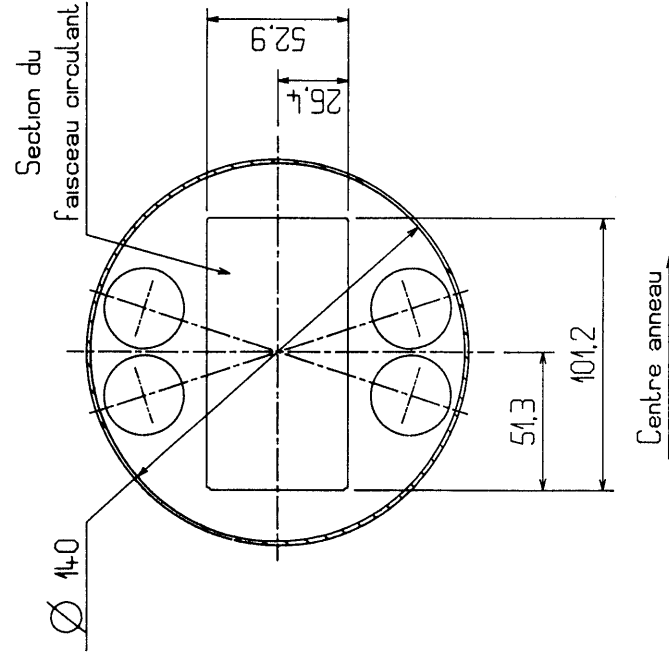
A-A



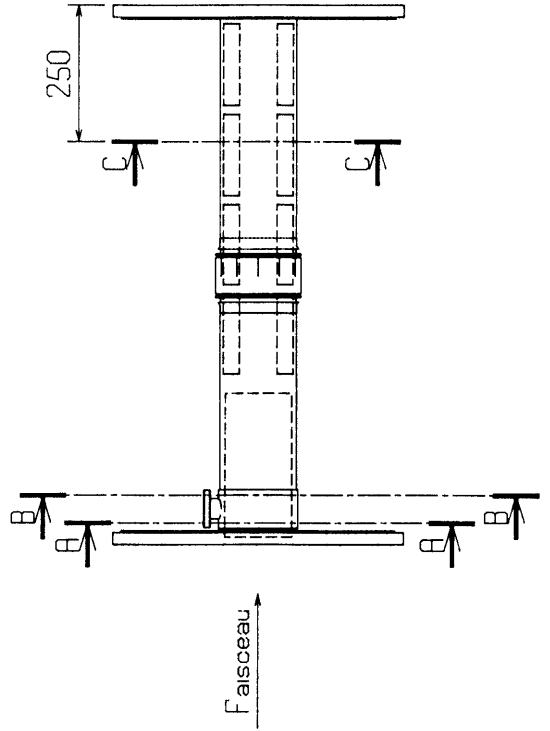
B-B



C-C



Vue depuis le centre de l'anneau

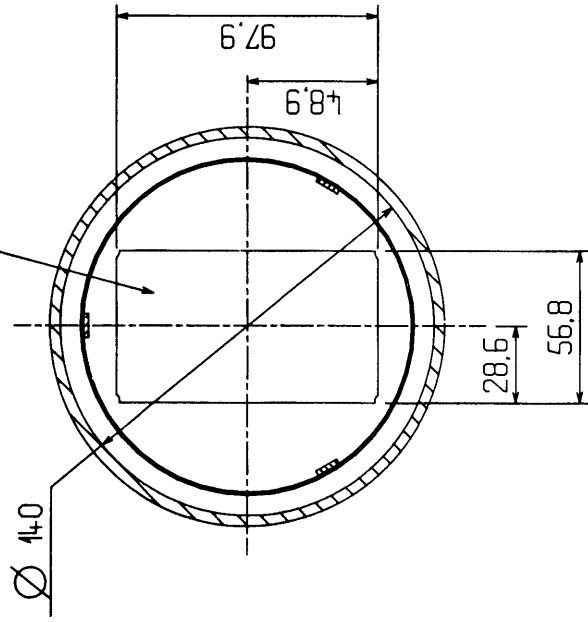


Beam dimensions inside the quadrupoles  
of the AC ring 30



A-A

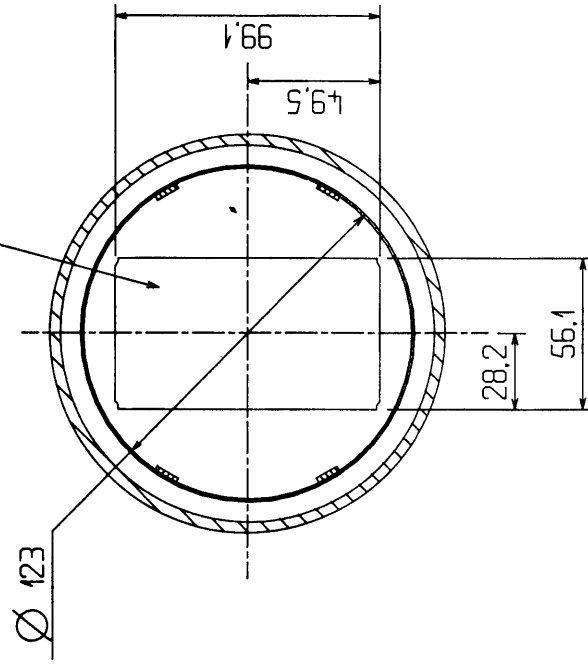
Section du faisceau circulant



Centre anneau

B-B

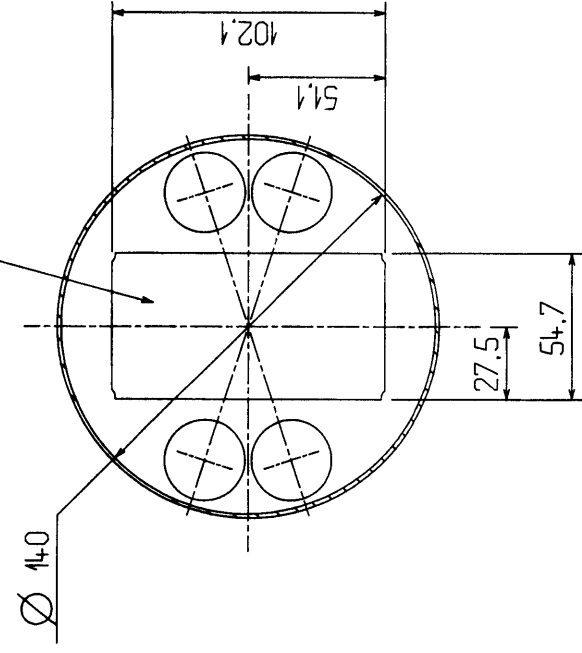
Section du faisceau circulant



Centre anneau

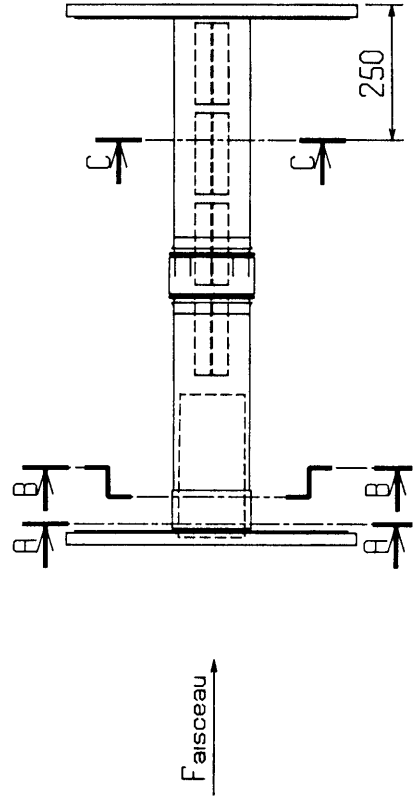
C-C

Section du faisceau circulant



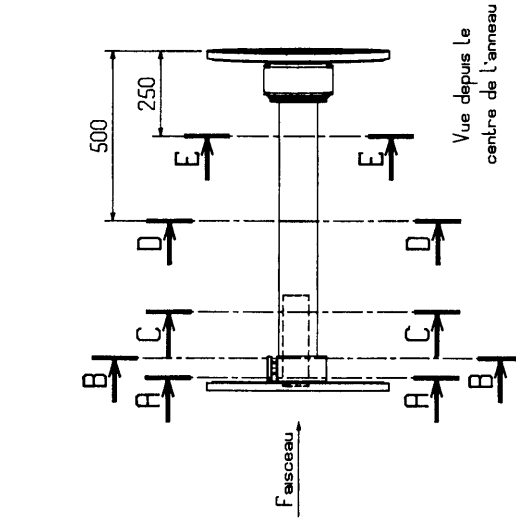
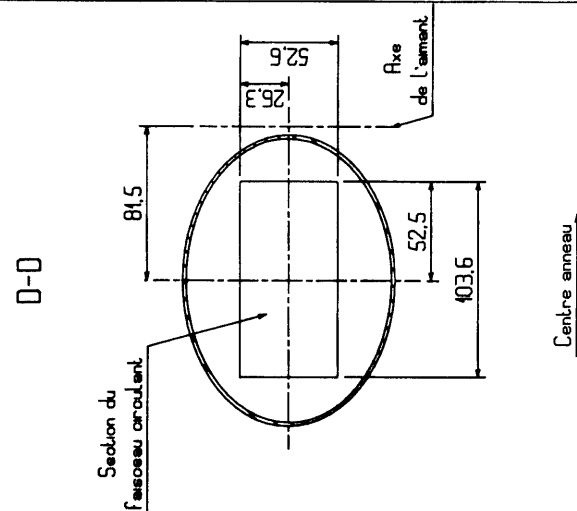
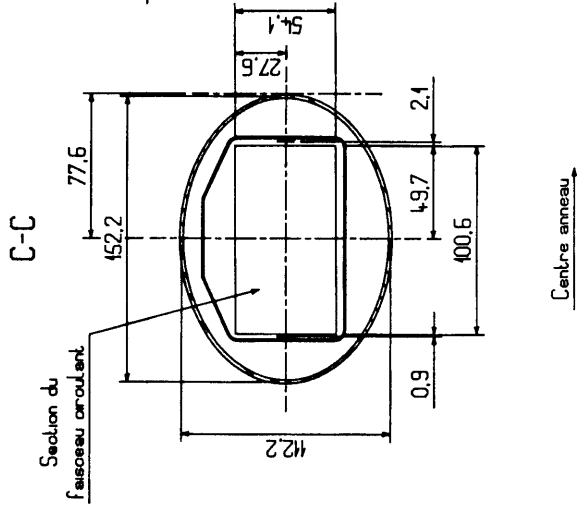
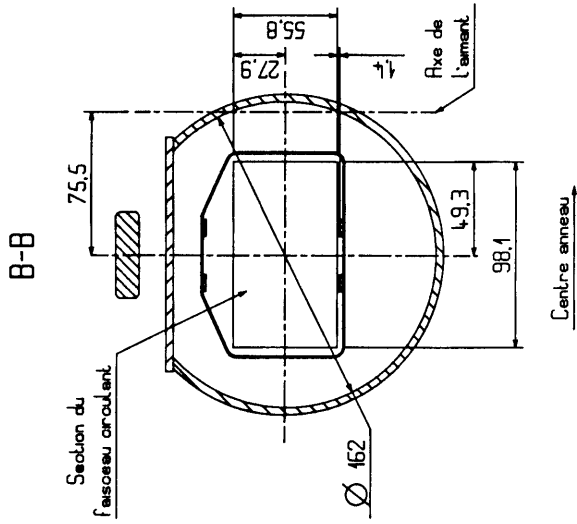
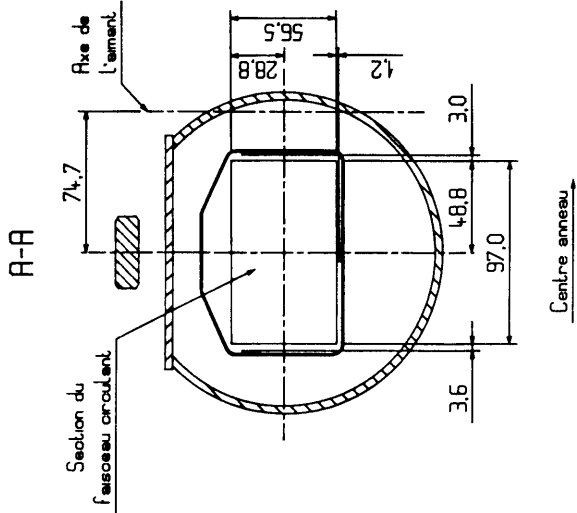
Centre anneau

Vue depuis le centre de l'anneau

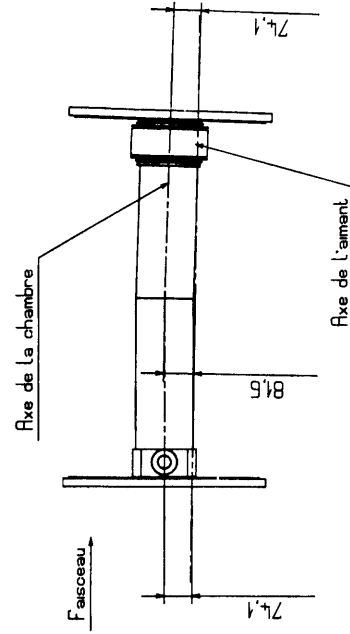


Faisceau

Beam dimensions inside the quadrupoles of the AC ring

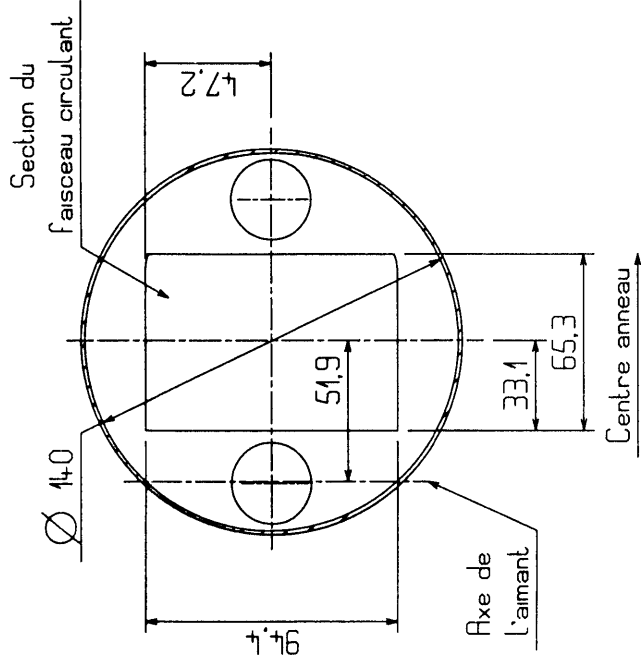


Vue de dessus

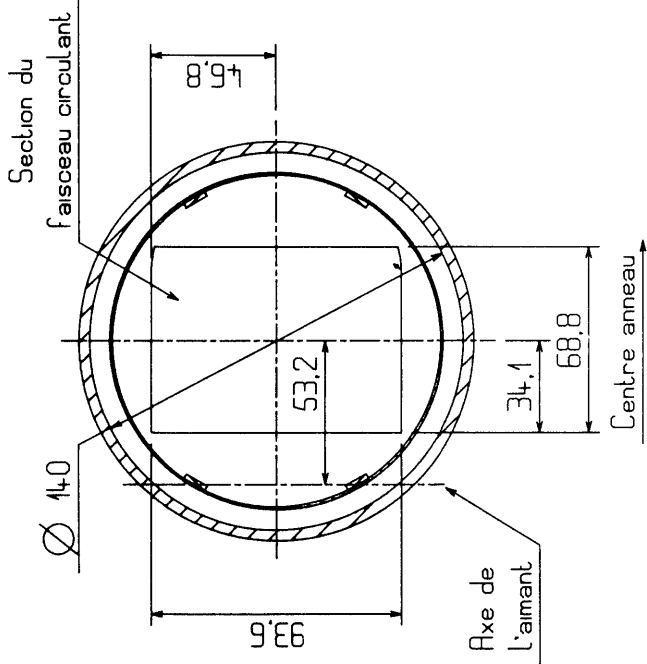


# Beam dimensions inside the quadrupoles of the AC ring 32

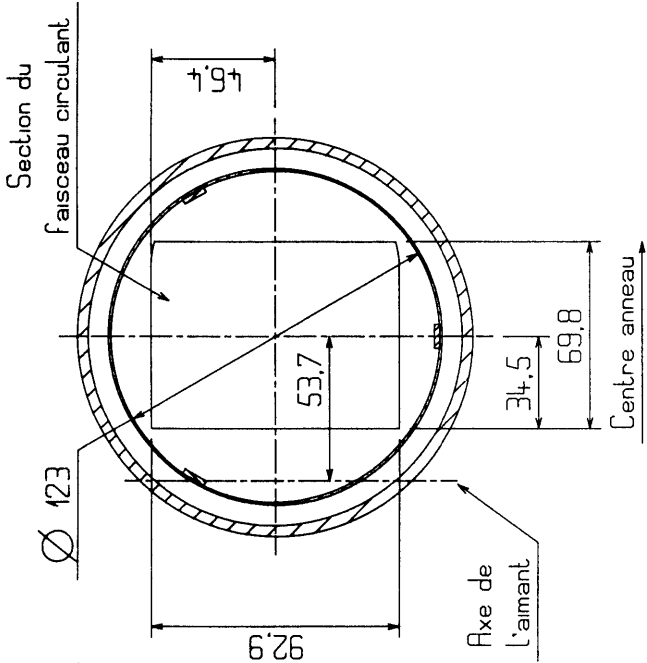
A-A



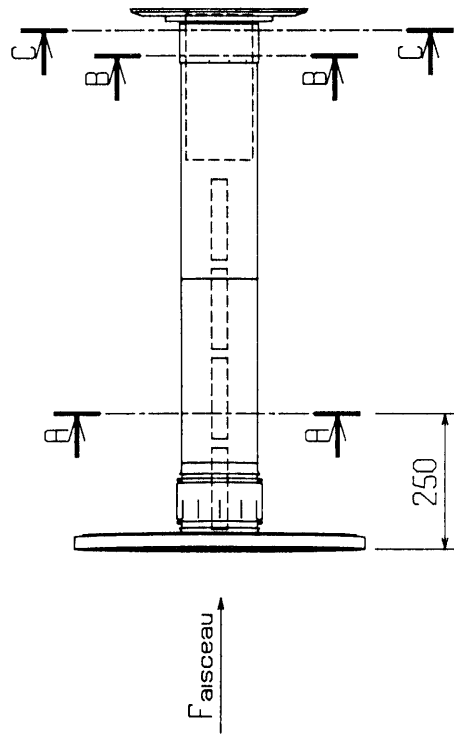
B-B



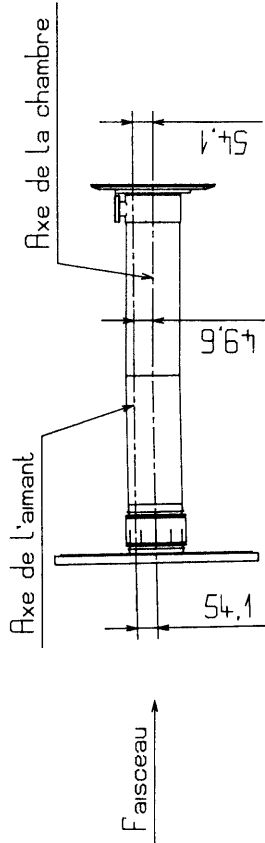
C-C



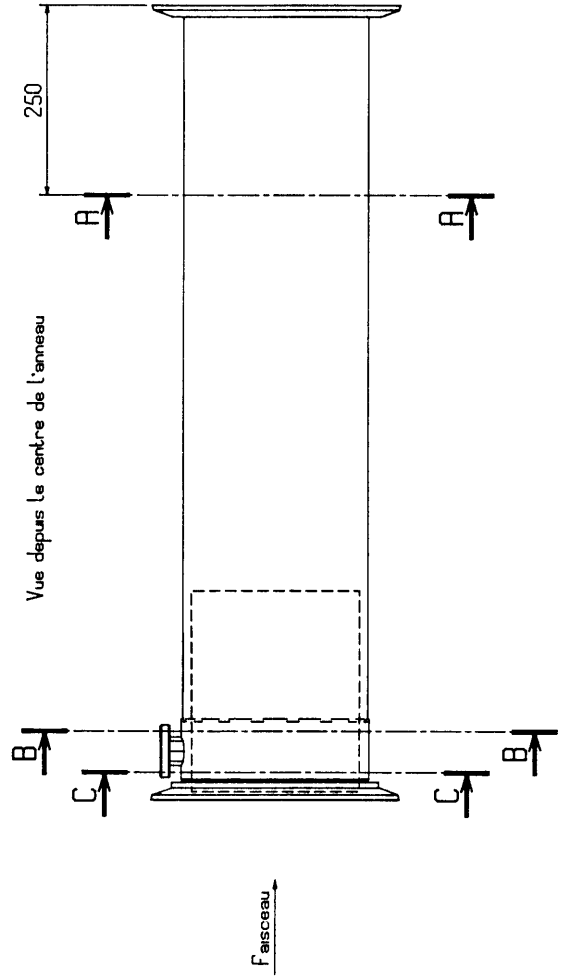
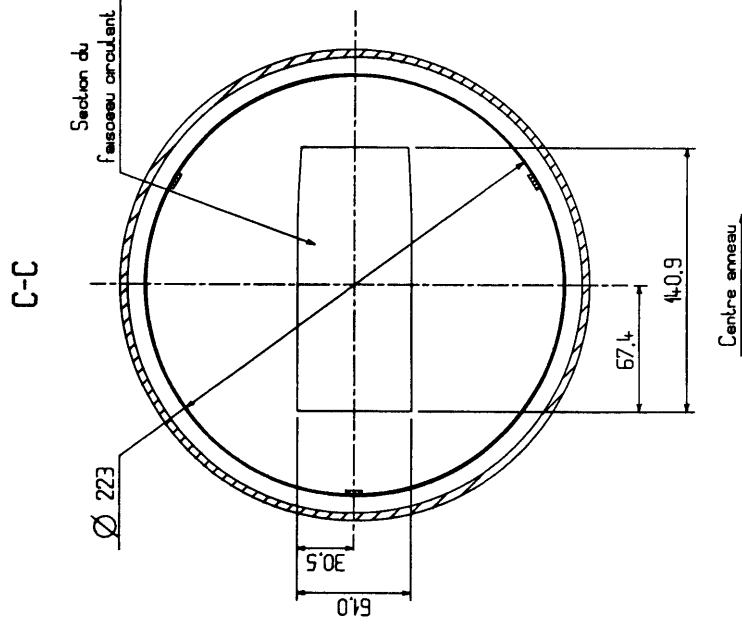
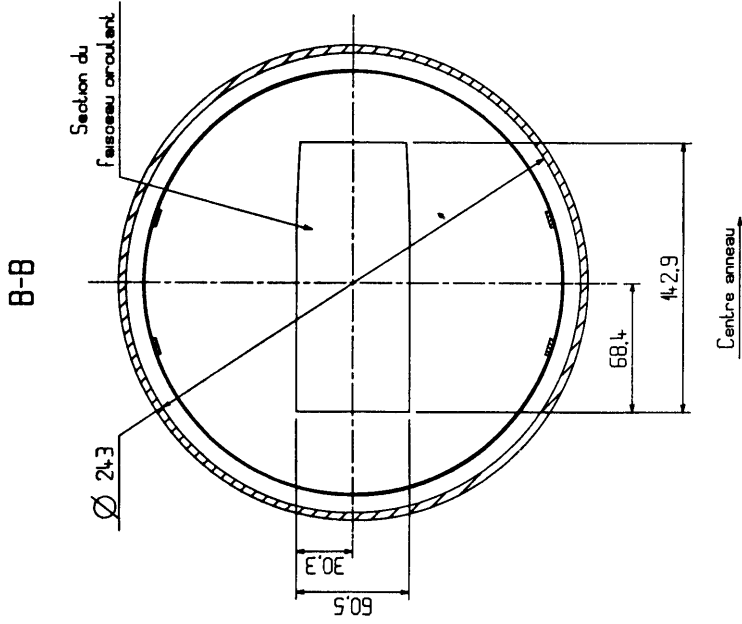
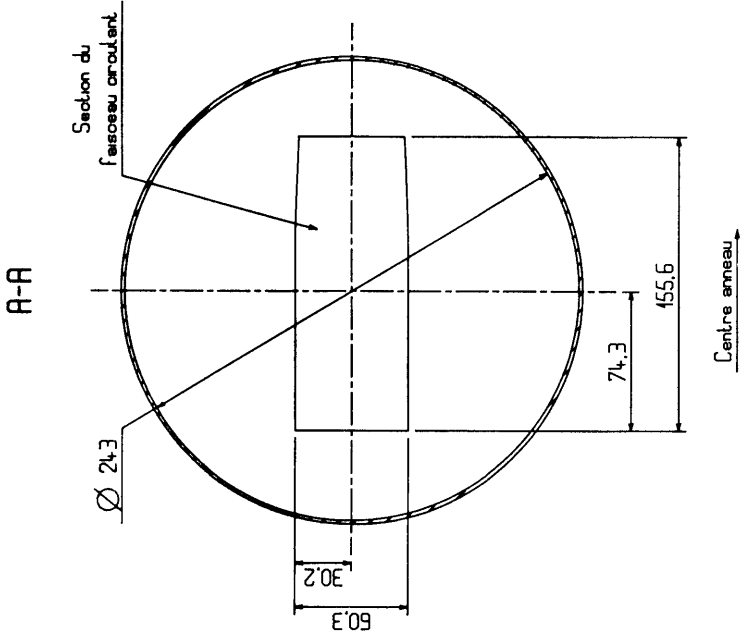
Vue depuis le centre de l'anneau



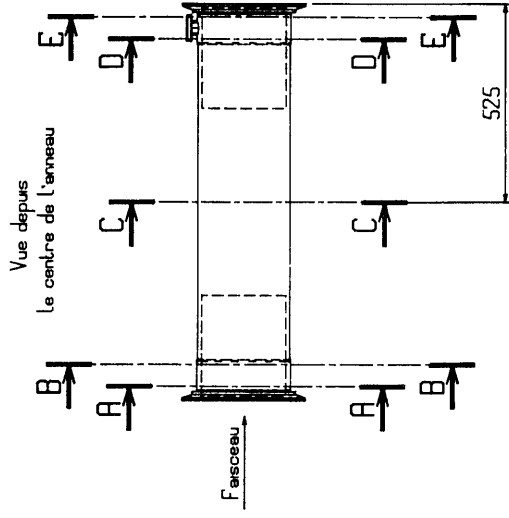
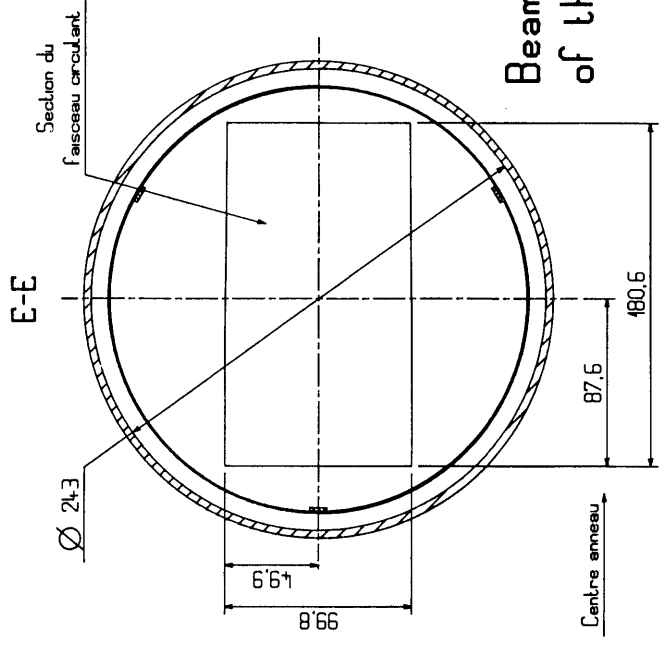
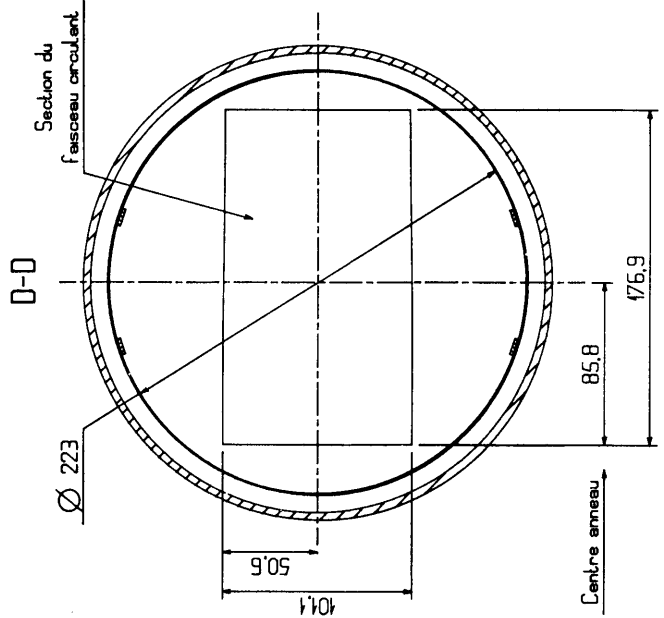
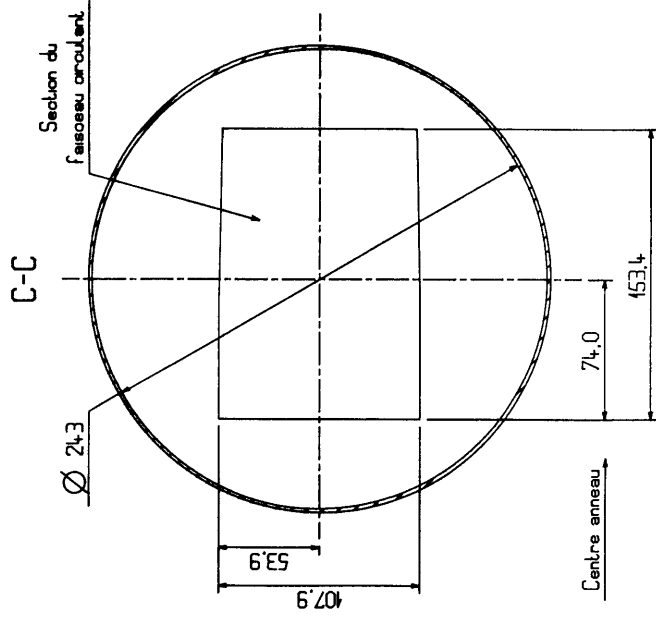
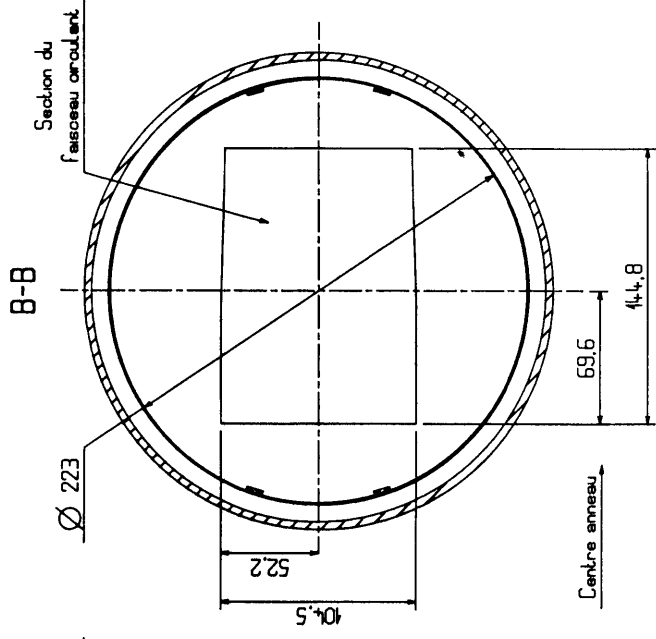
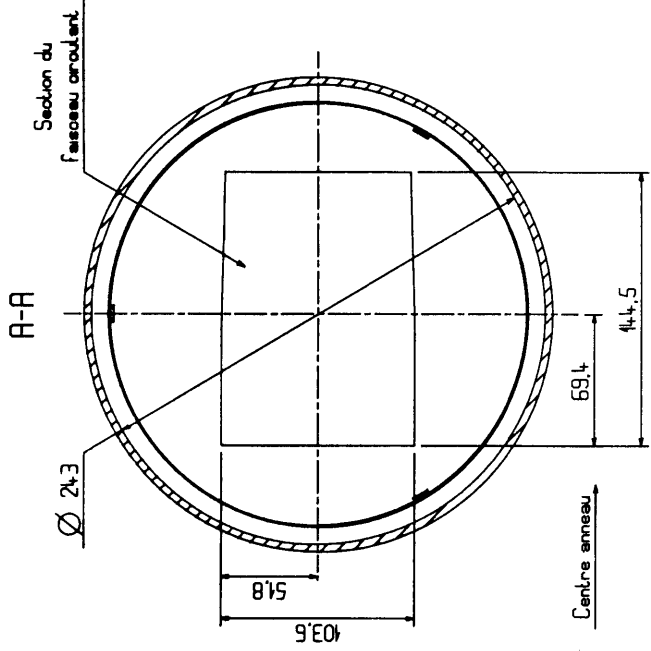
Vue de dessus



Beam dimensions inside the quadrupoles  
of the AC ring 33



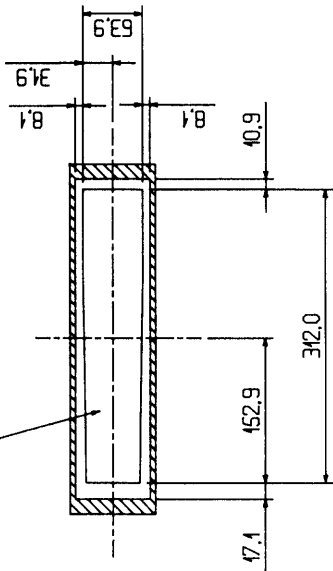
Beam dimensions inside the quadrupoles  
of the AC ring 34



Beam dimensions inside the quadrupoles  
of the AC ring **35**

A-A

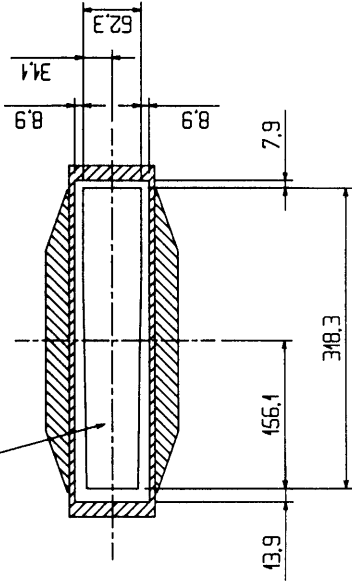
Section du faisceau circulant



Centre anneau

B-B

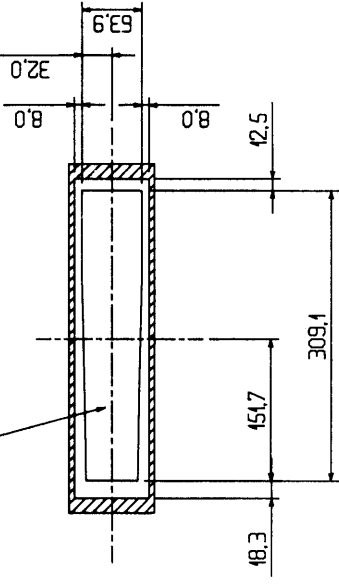
Section du faisceau circulant



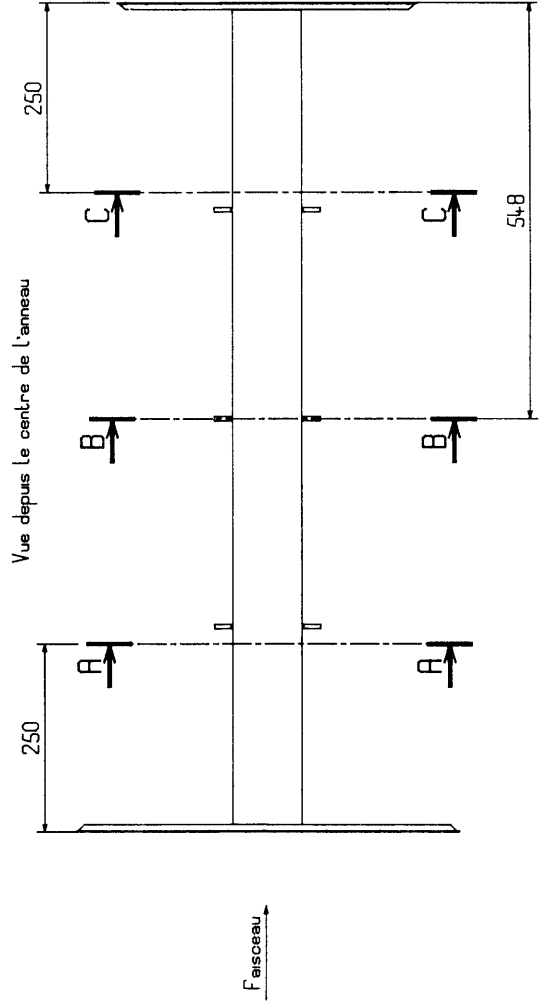
Centre anneau

C-C

Section du faisceau circulant

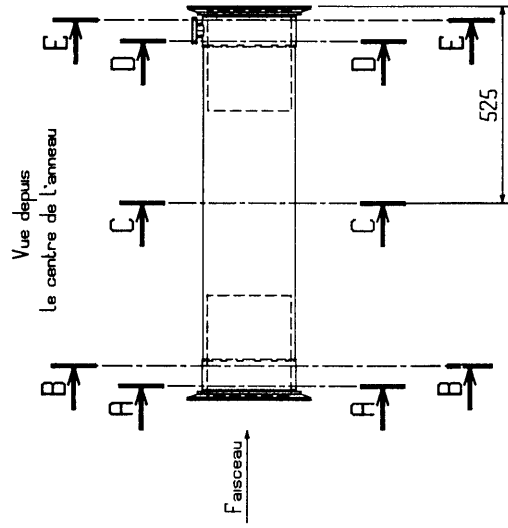
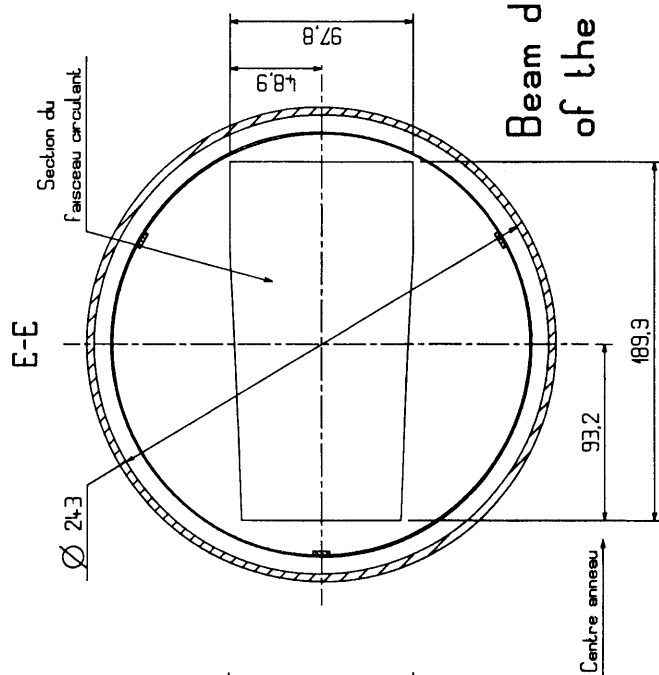
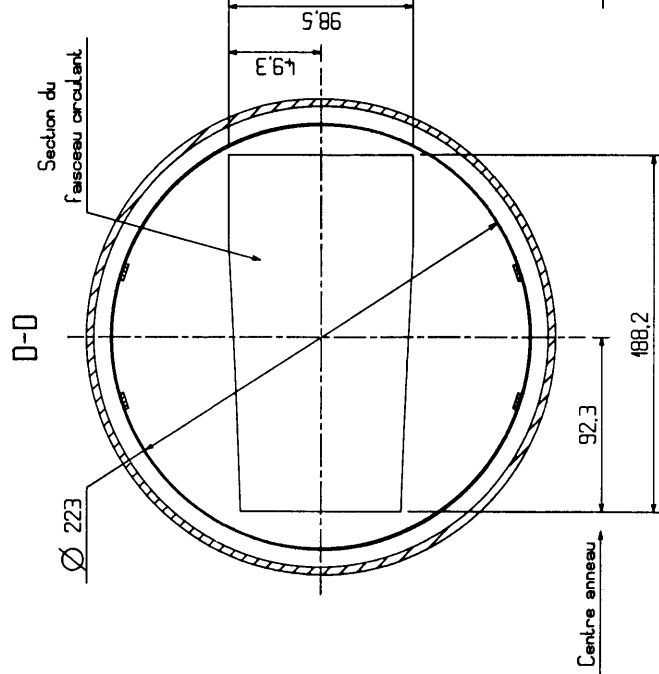
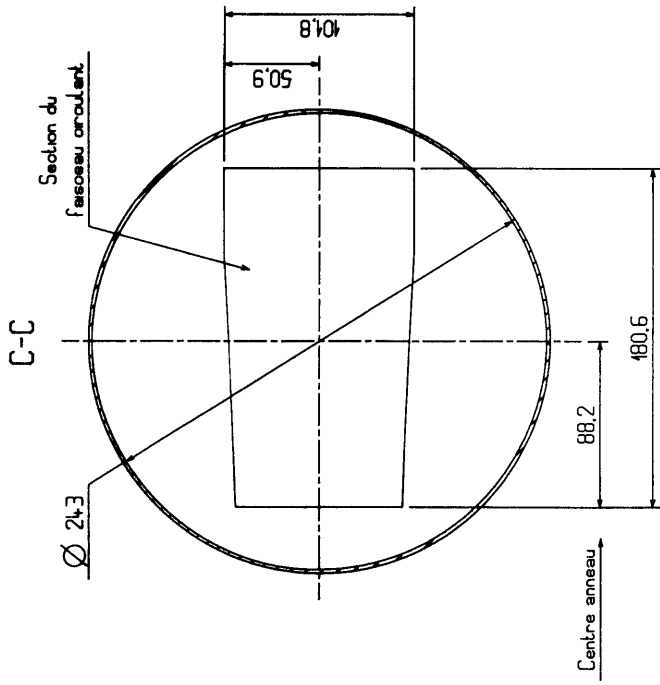
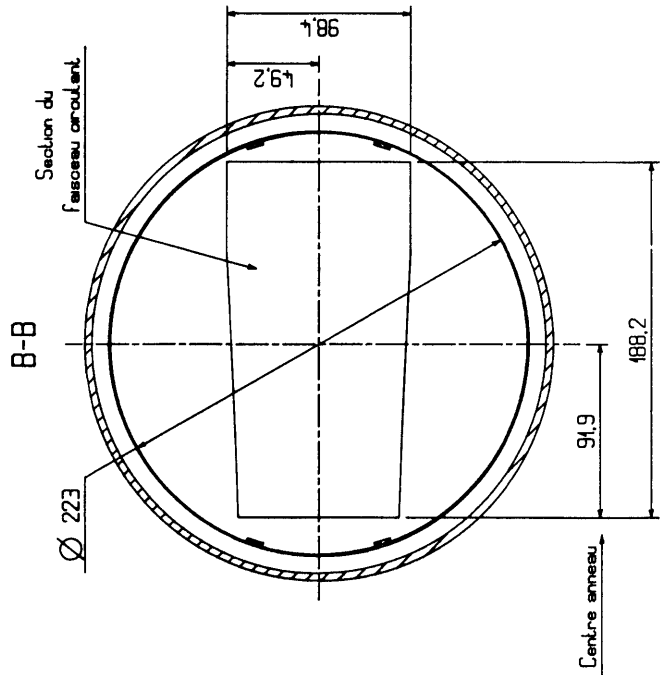
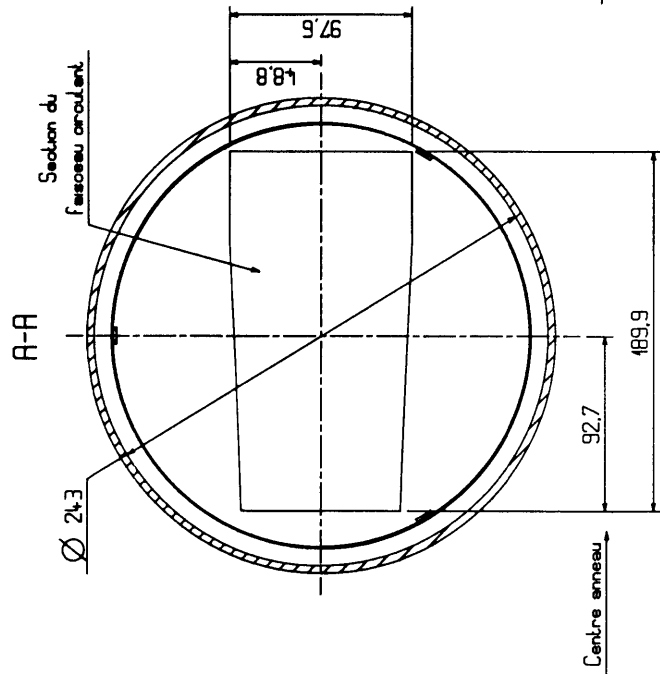


Centre anneau



Vue depuis le centre de l'anneau

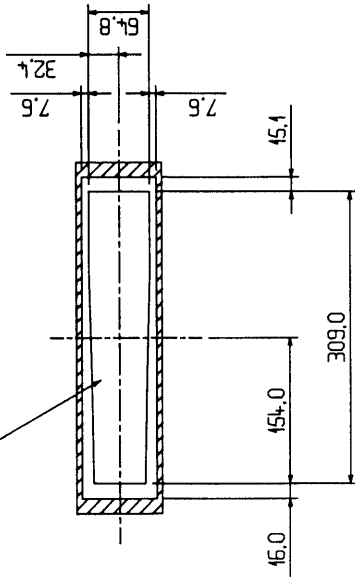
# Beam dimensions inside the quadrupoles of the AC ring 36



Beam dimensions inside the quadrupoles  
of the AC ring **37**

A-A

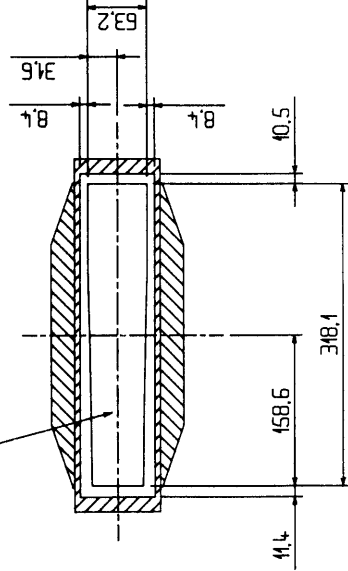
Section du faisceau circulant



Centre anneau

B-B

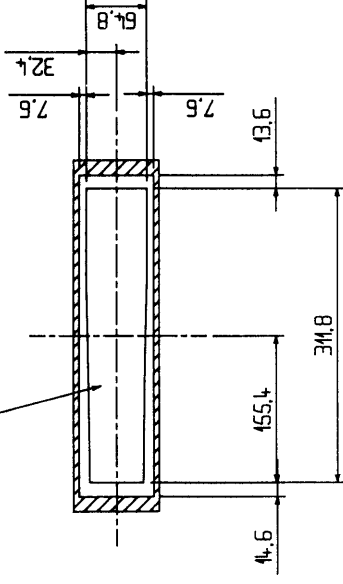
Section du faisceau circulant



Centre anneau

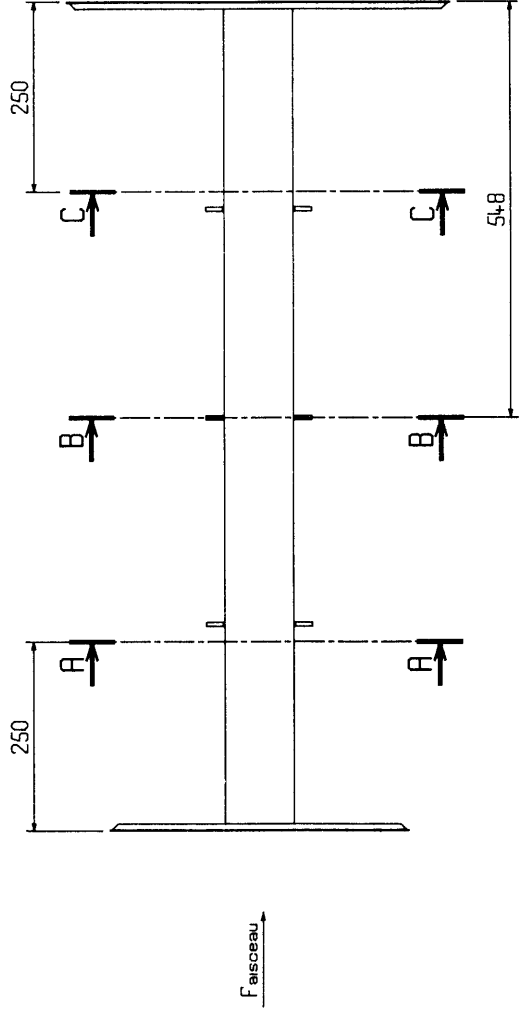
C-C

Section du faisceau circulant



Centre anneau

Vue depuis le centre de l'anneau

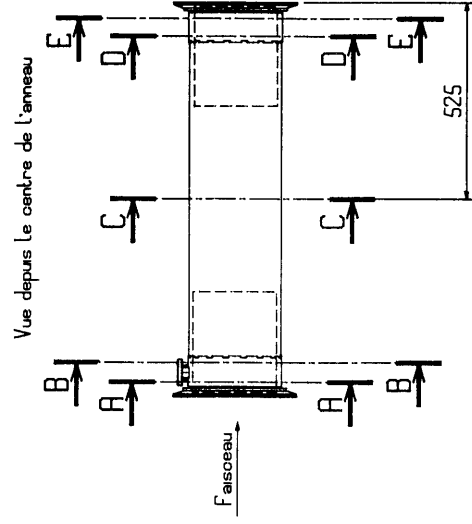
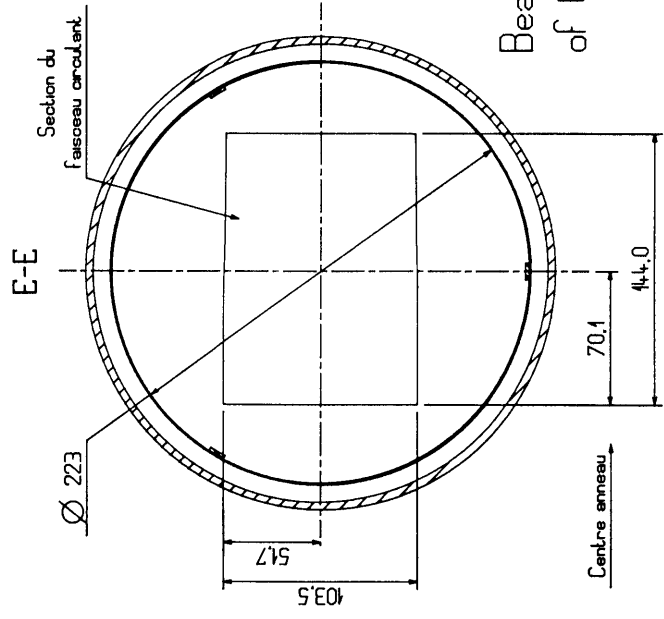
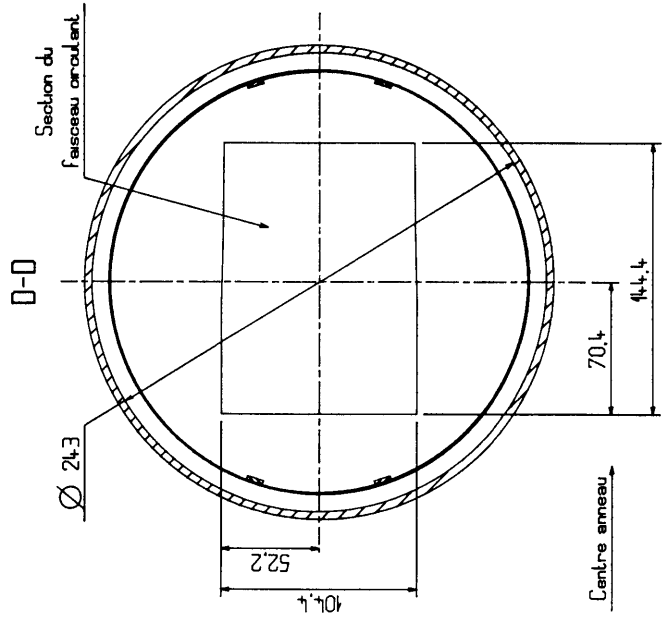
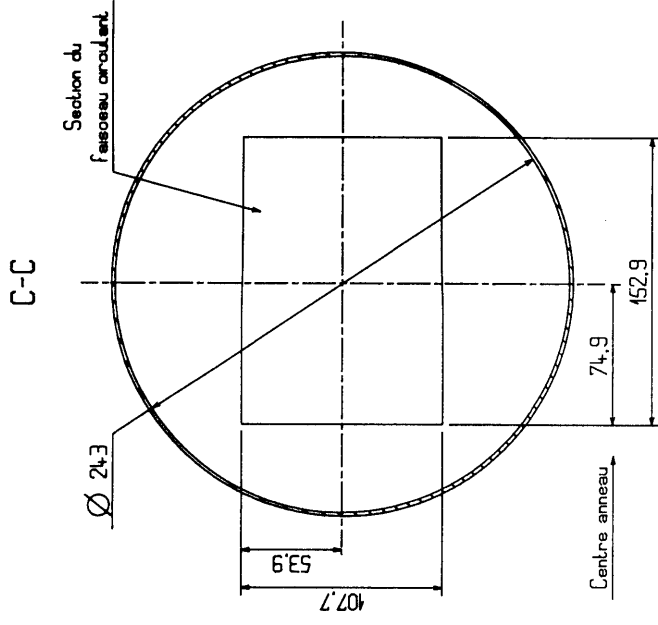
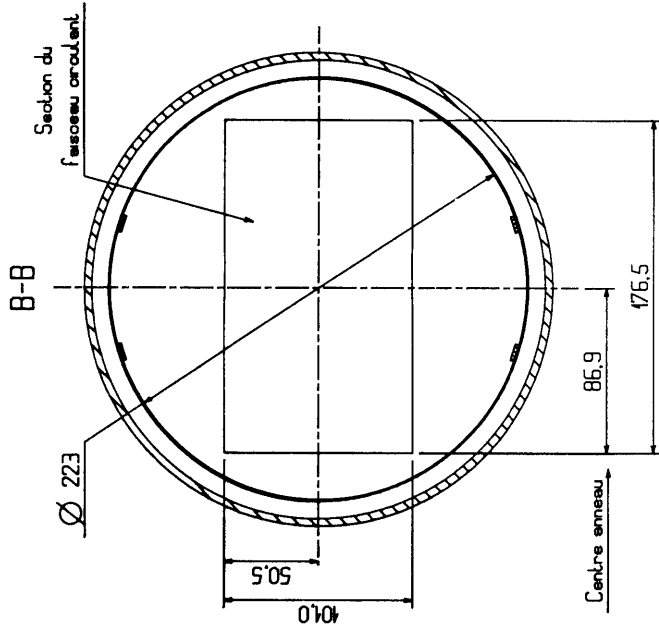
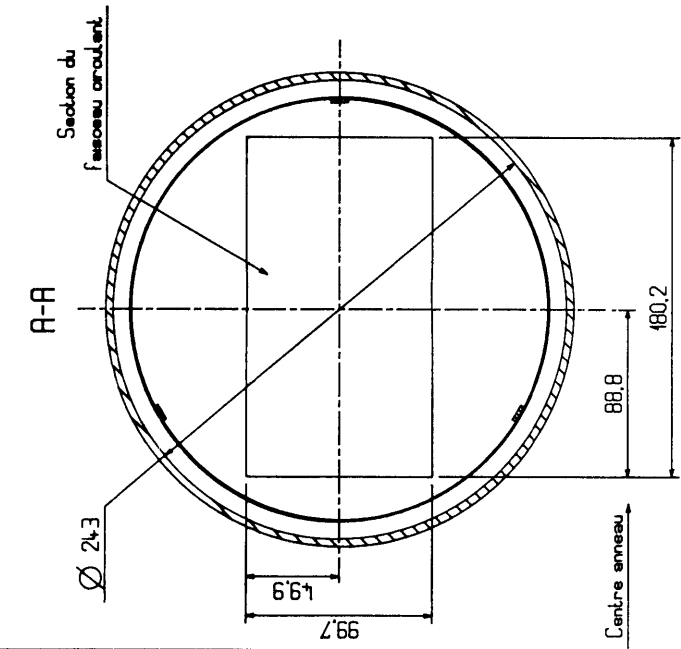


Faisceau

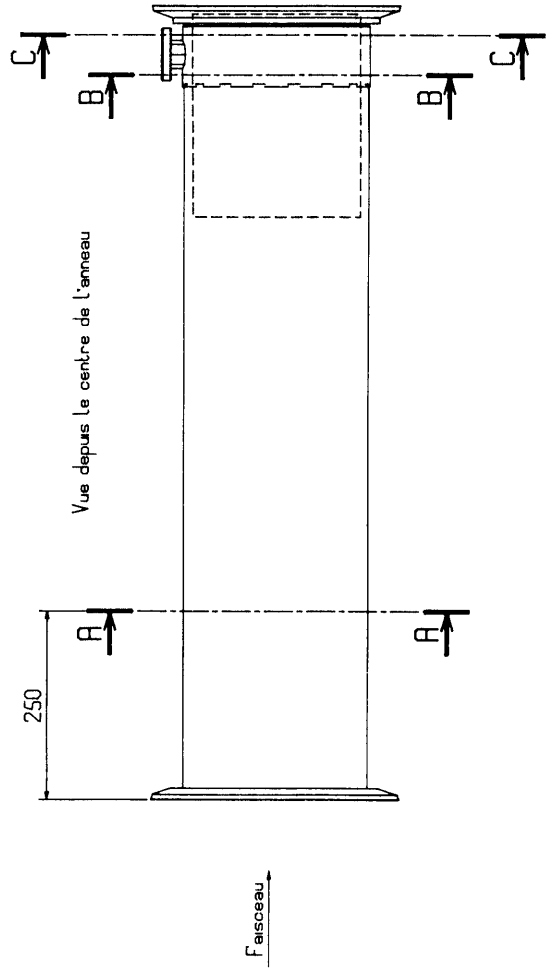
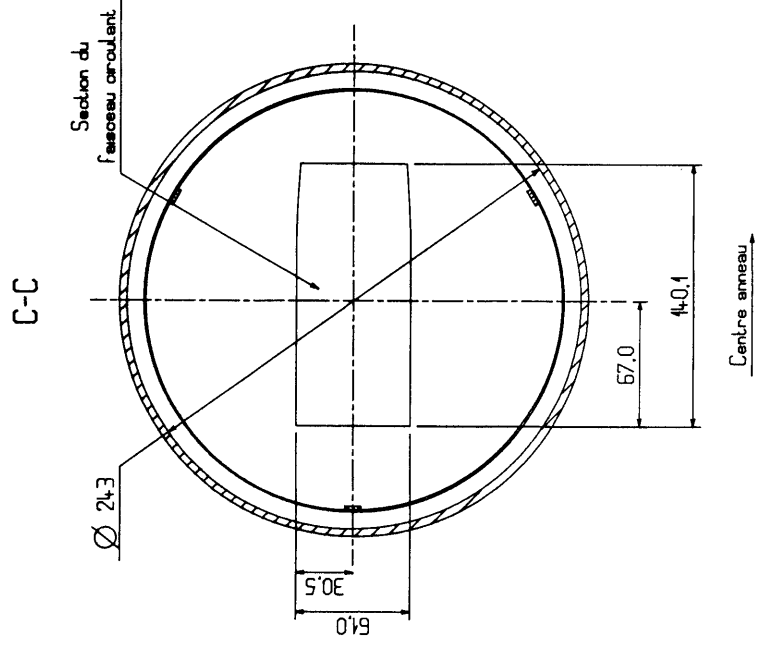
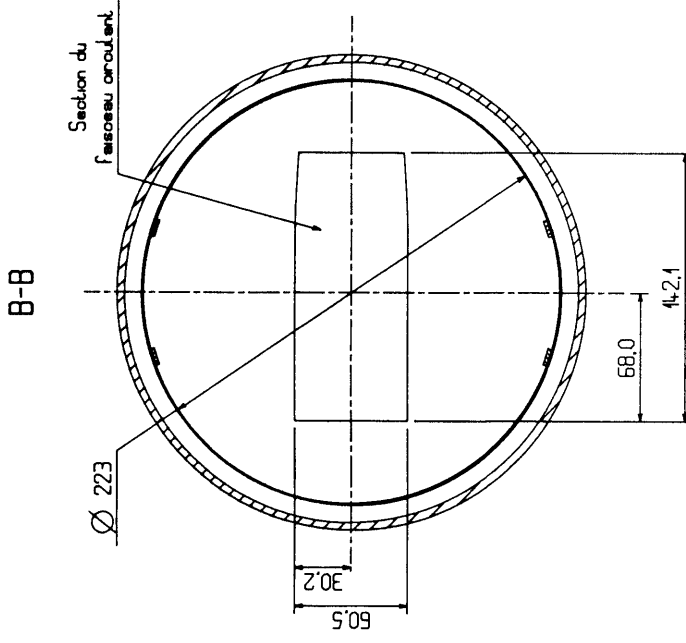
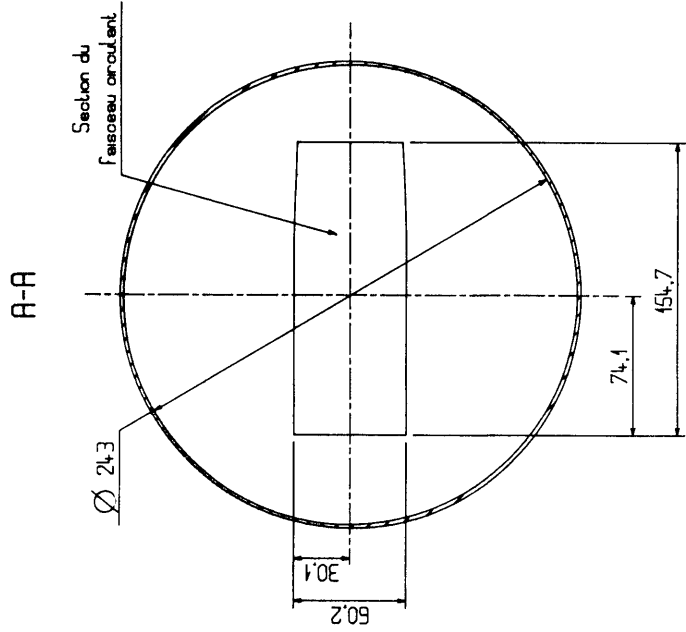
Beam dimensions inside the quadrupoles  
of the AC ring

38



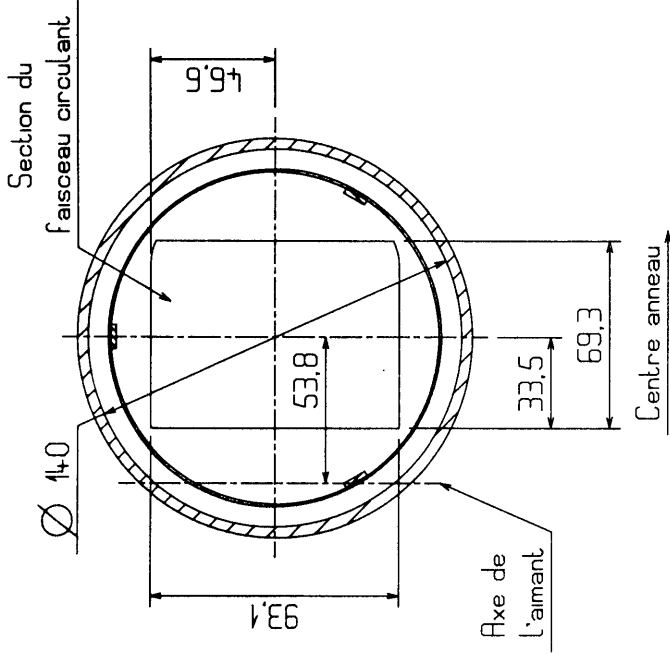


Beam dimensions inside the quadrupoles  
of the AC ring

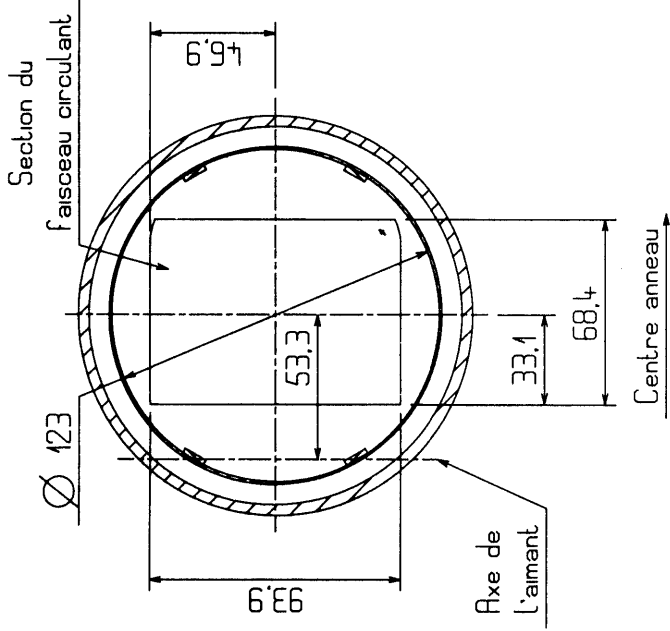


Beam dimensions inside the quadrupoles  
of the AC ring **40**

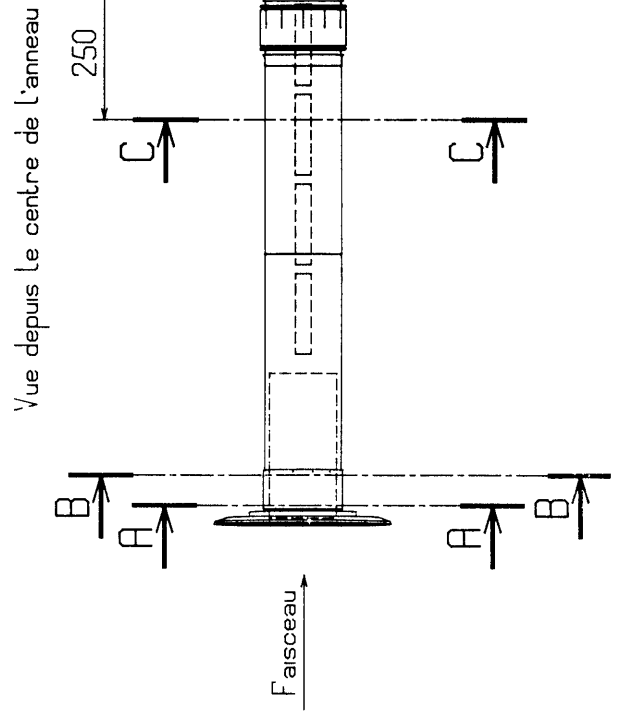
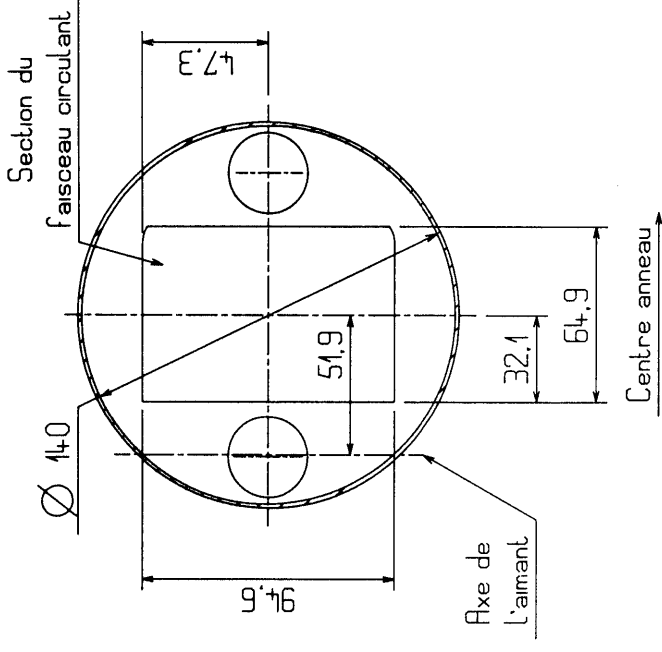
A-A



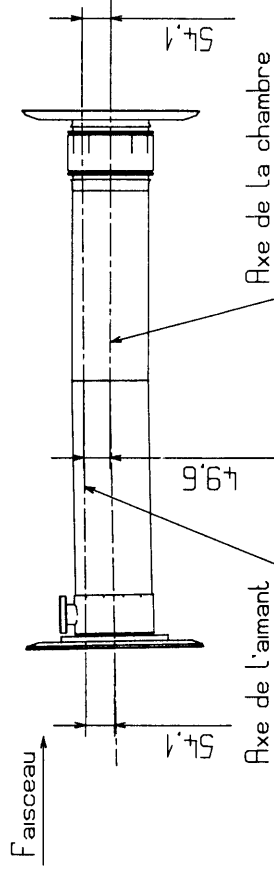
B-B



C-C



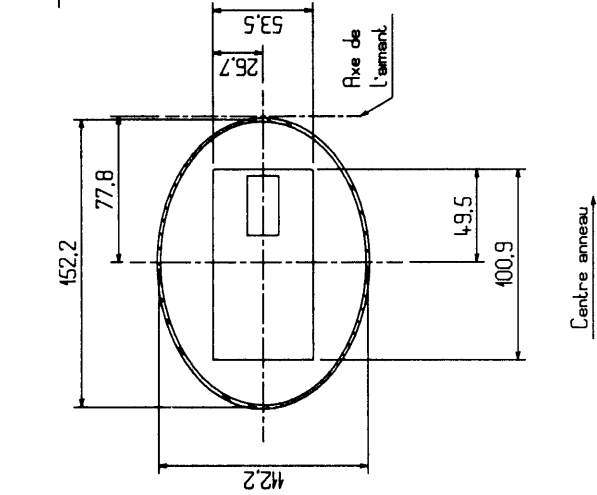
Vue de dessus



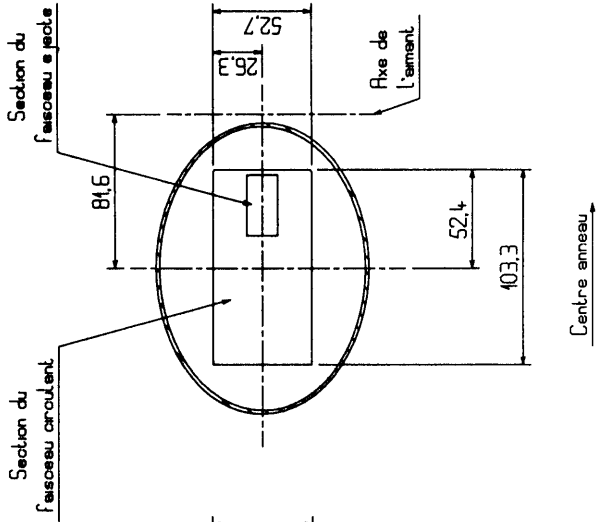
Beam dimensions inside the quadrupoles  
of the AC ring

41

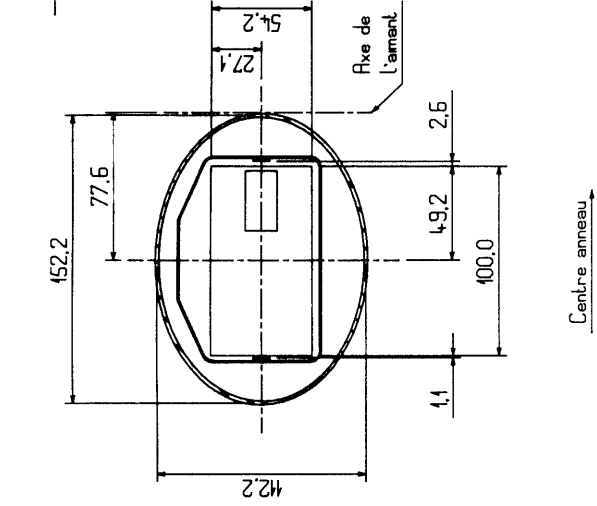
A-A



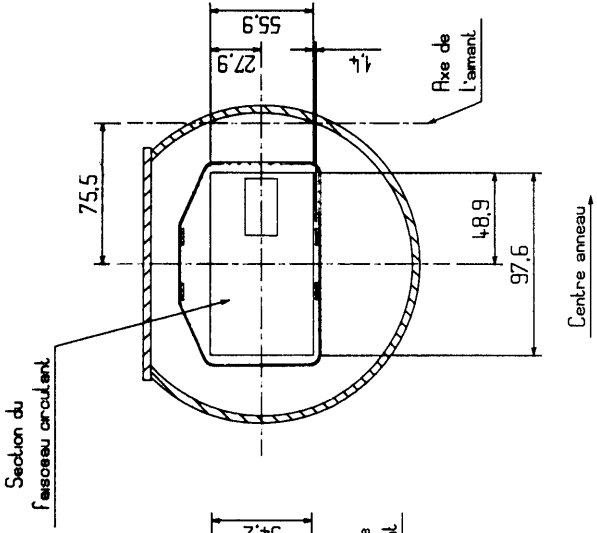
B-B



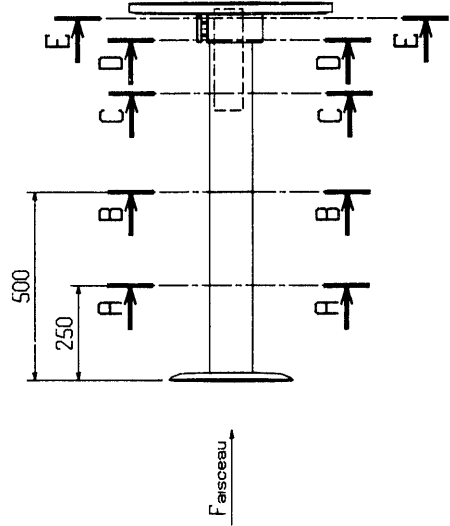
C-C



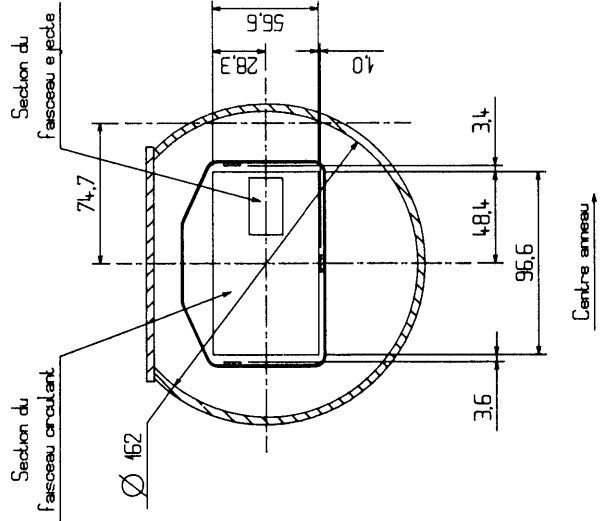
D-D



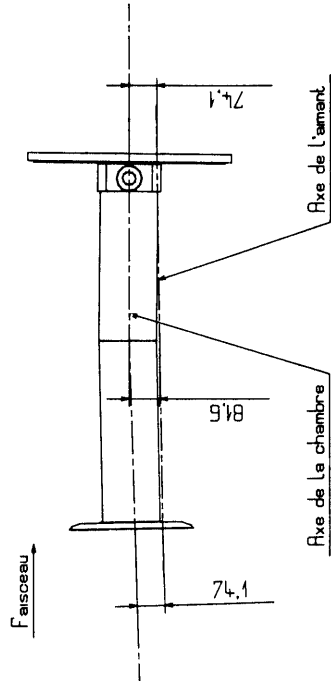
Vue depuis le centre de l'anneau



E-E

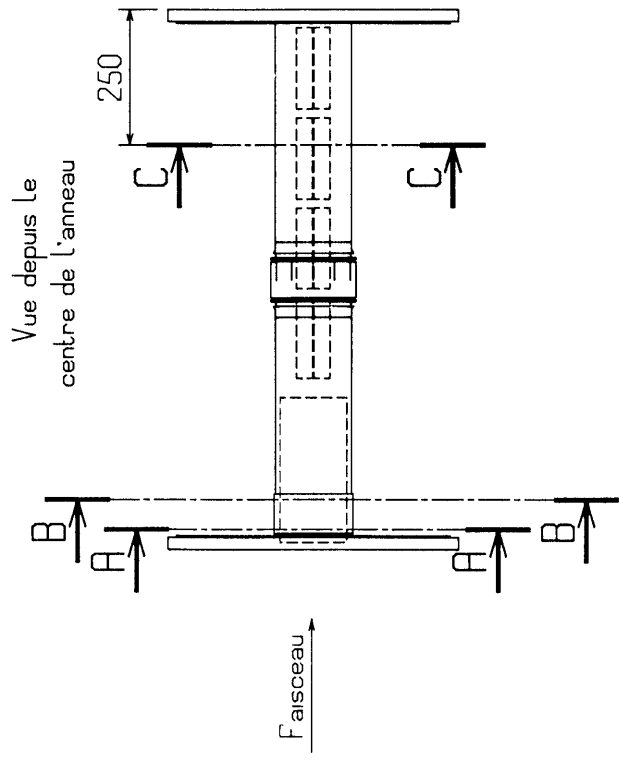
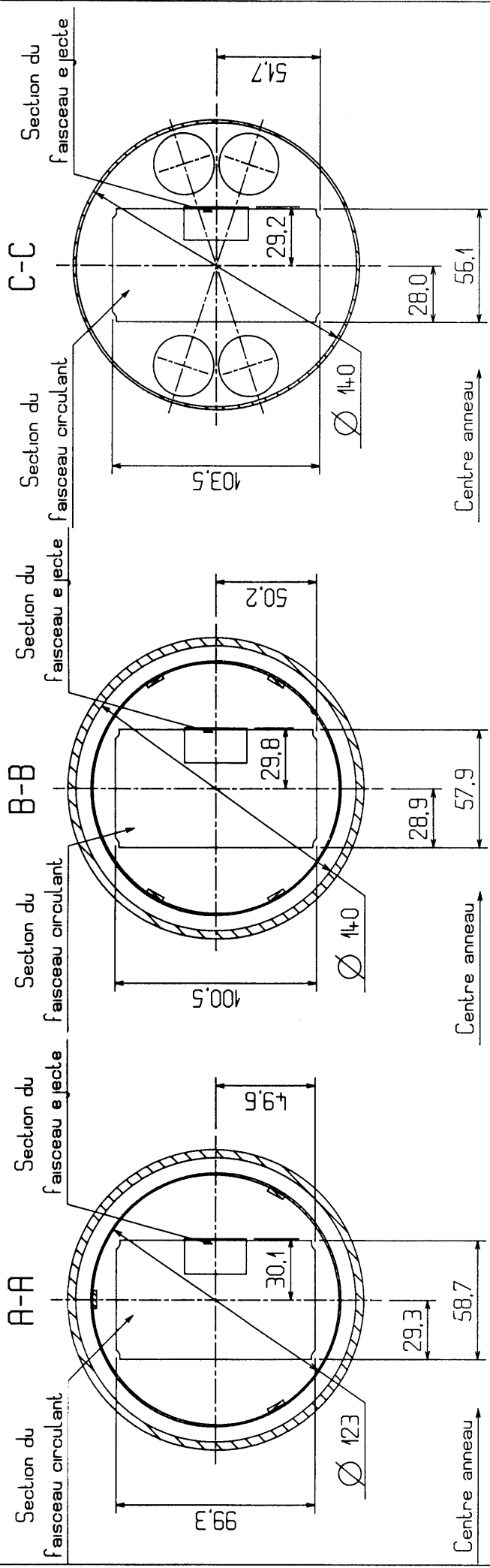


Vue de dessus

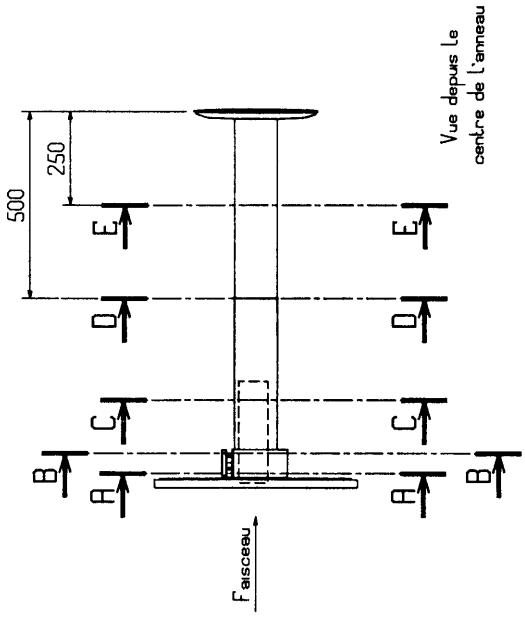
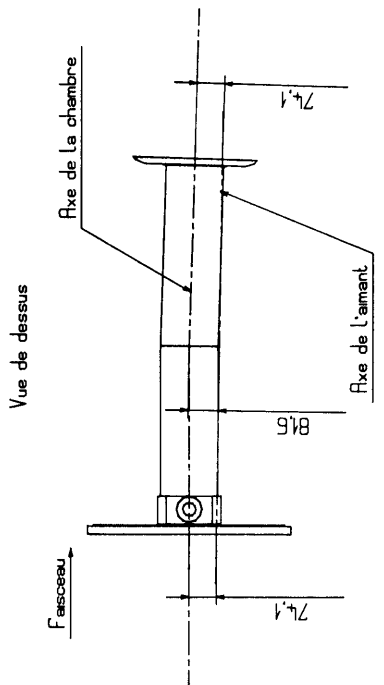
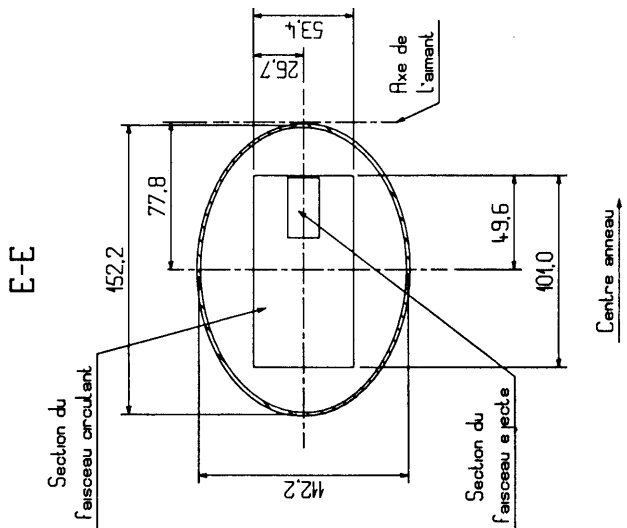
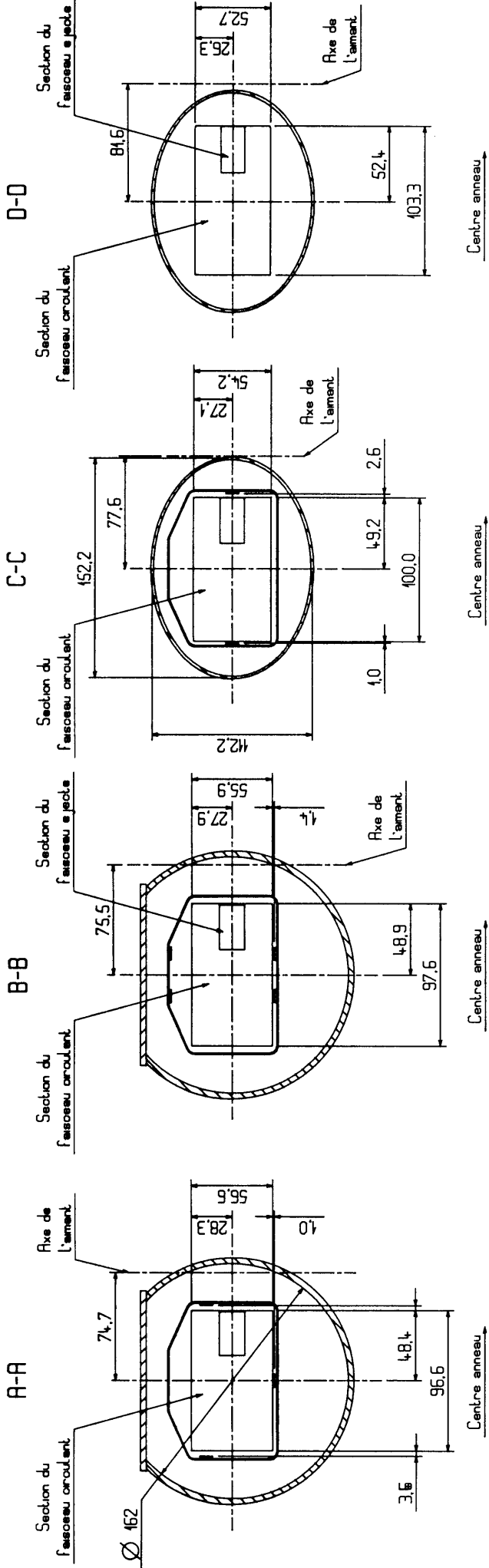


Beam dimensions inside the quadrupoles of the AC ring

42

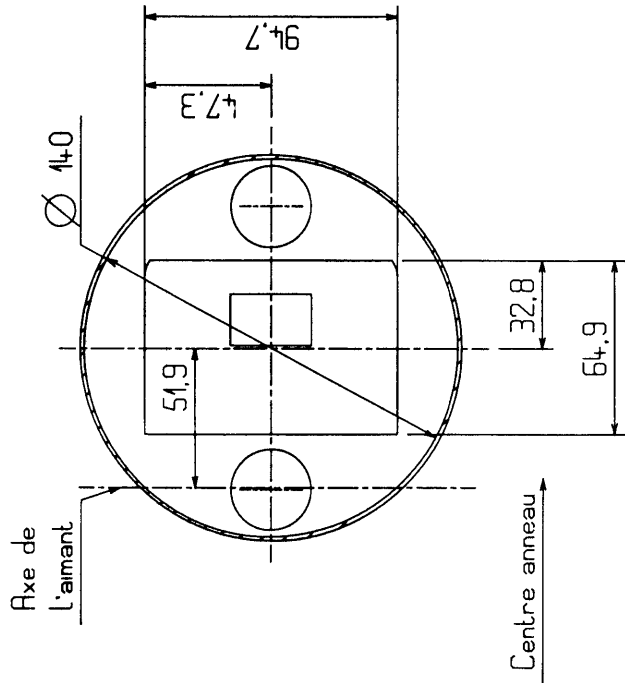


Beam dimensions inside the quadrupoles  
of the AC ring 43

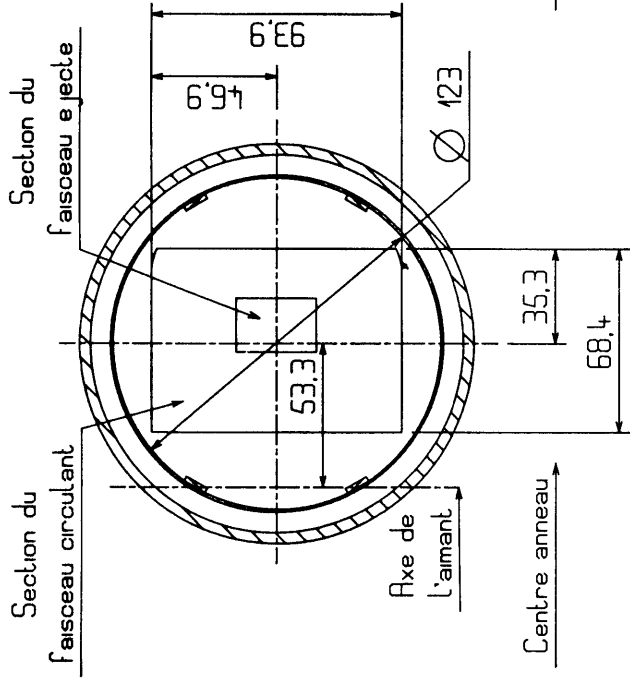


Beam dimensions inside the quadrupoles  
of the AC ring

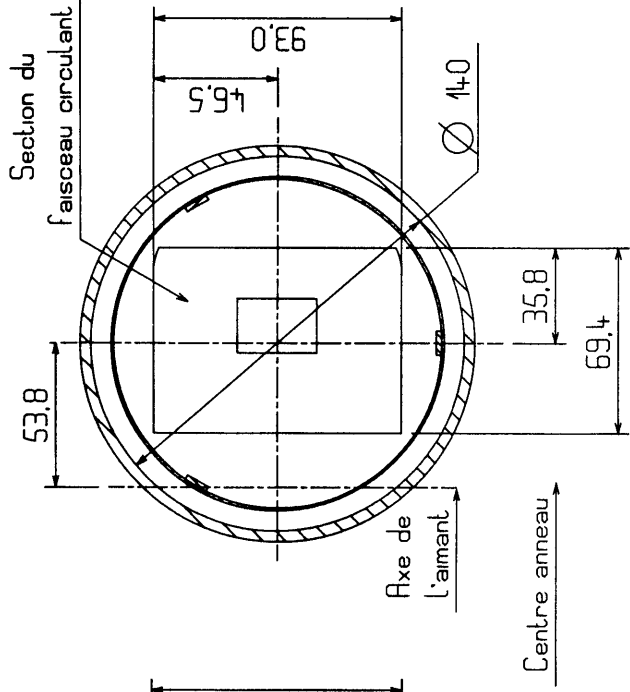
A-A



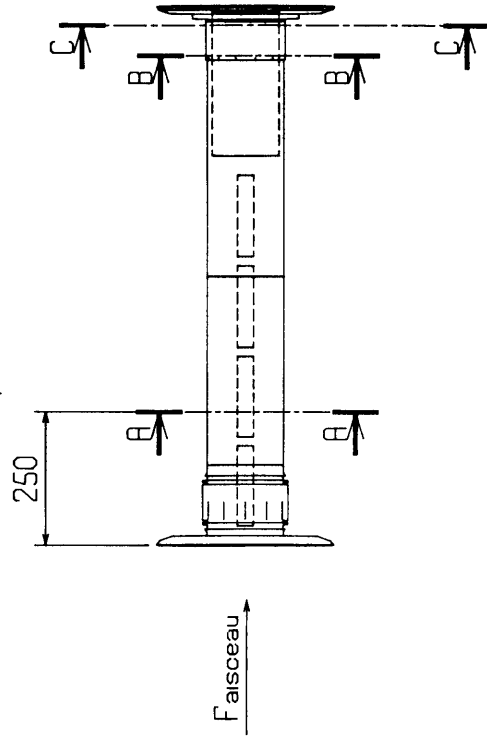
B-B



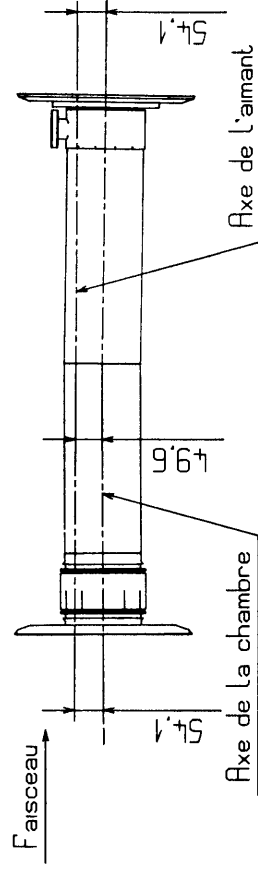
C-C



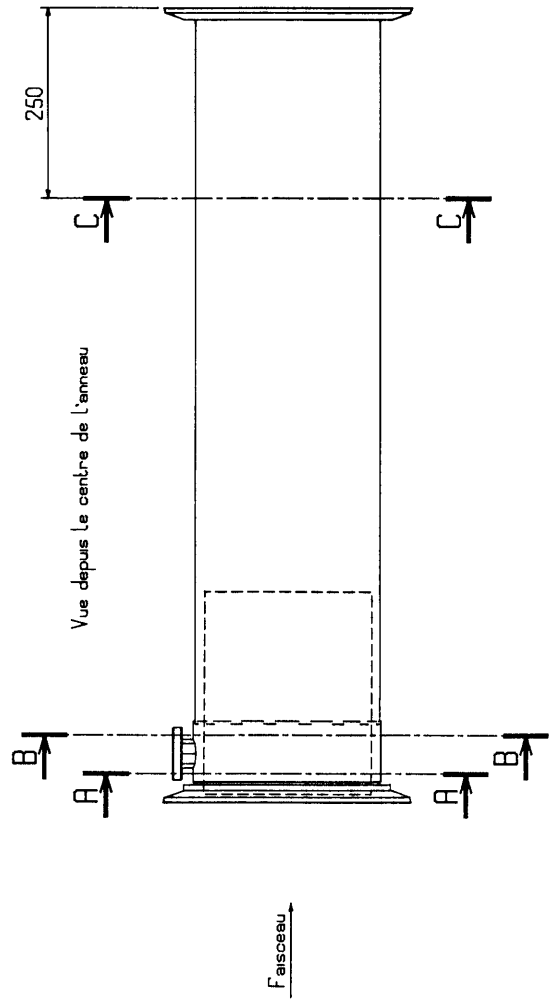
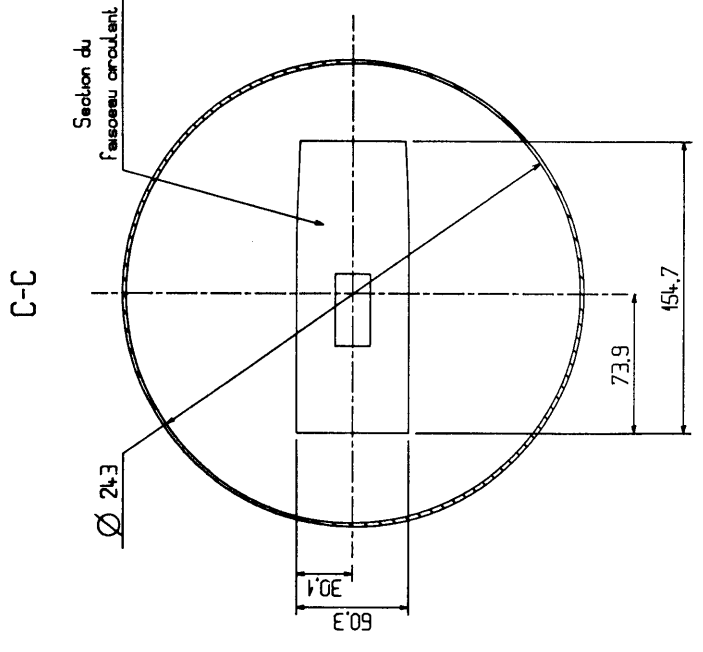
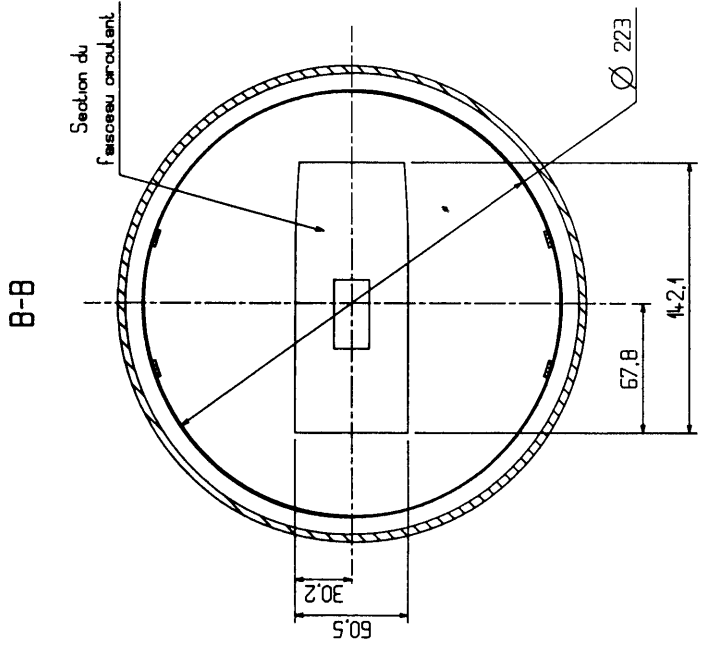
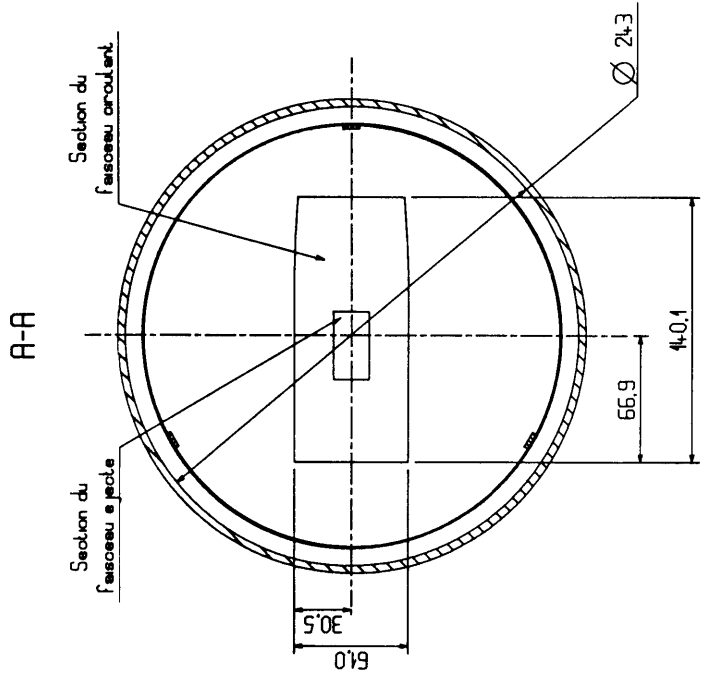
Vue depuis le centre de l'anneau



Vue de dessus

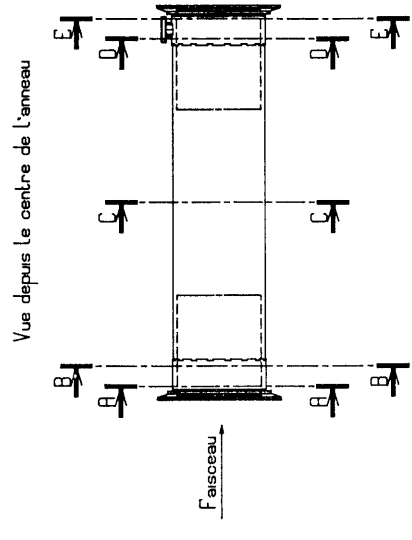
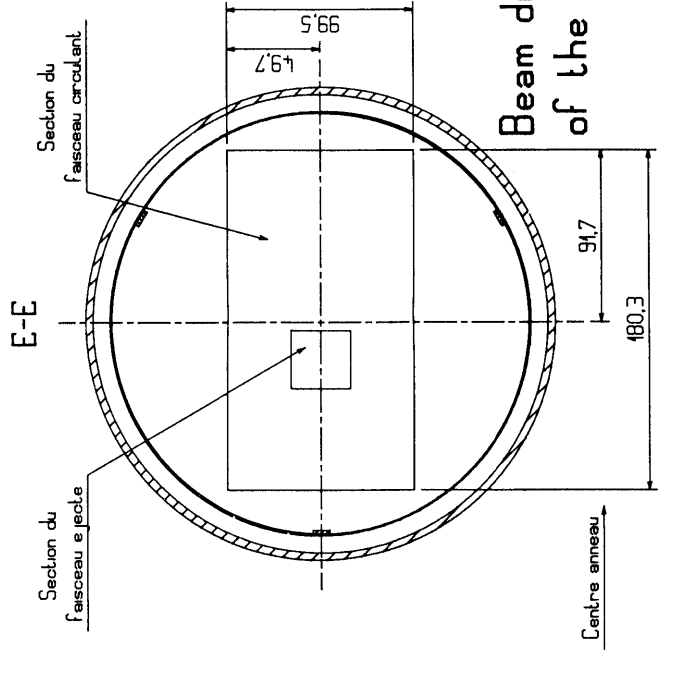
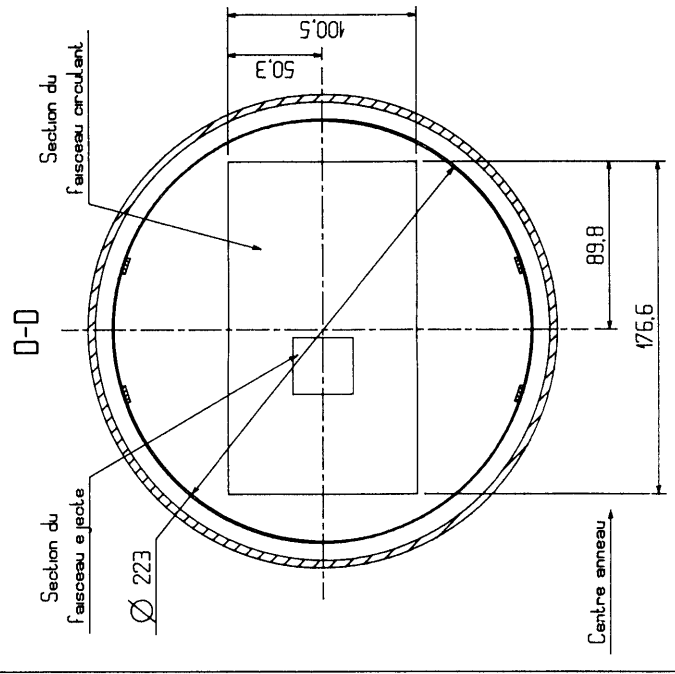
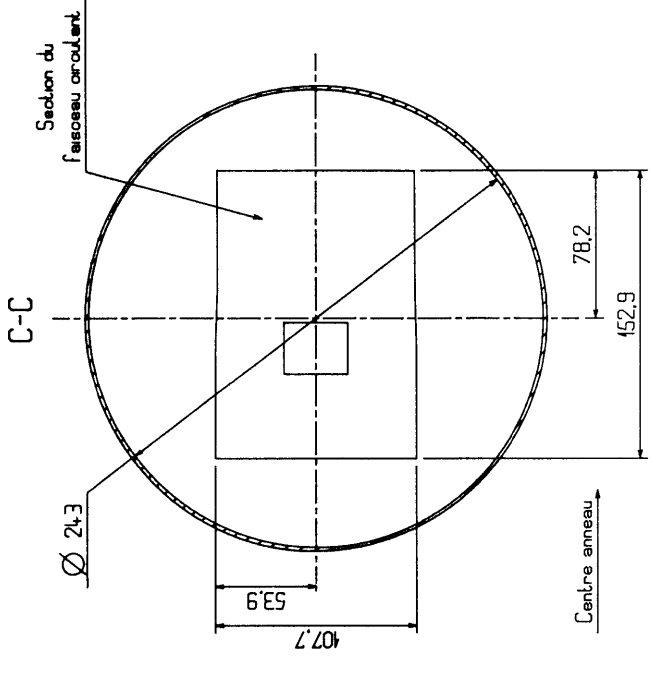
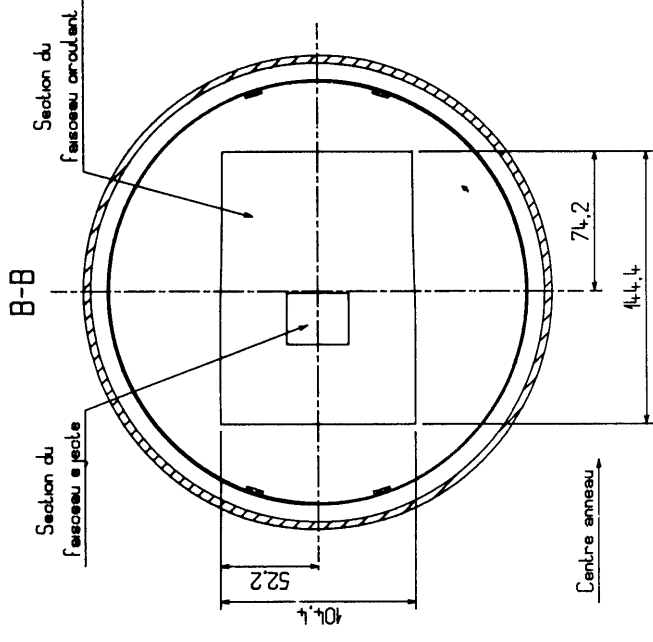
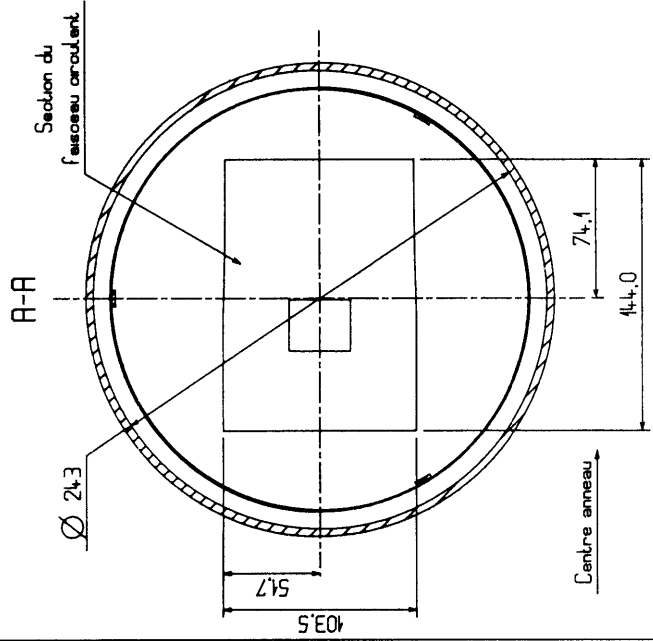


Beam dimensions inside the quadrupoles  
of the AC ring 45



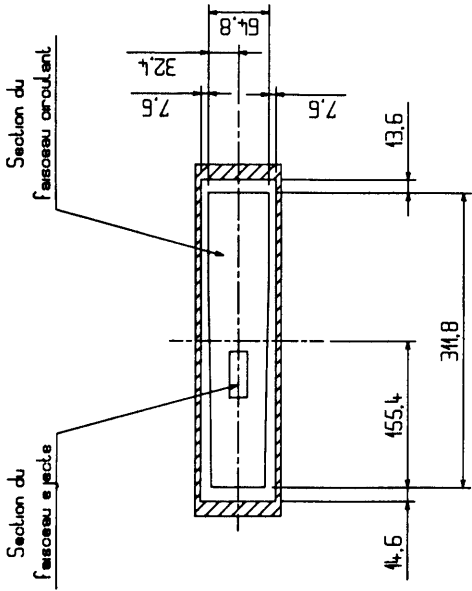
Beam dimensions inside the quadrupoles  
of the AC ring **46**



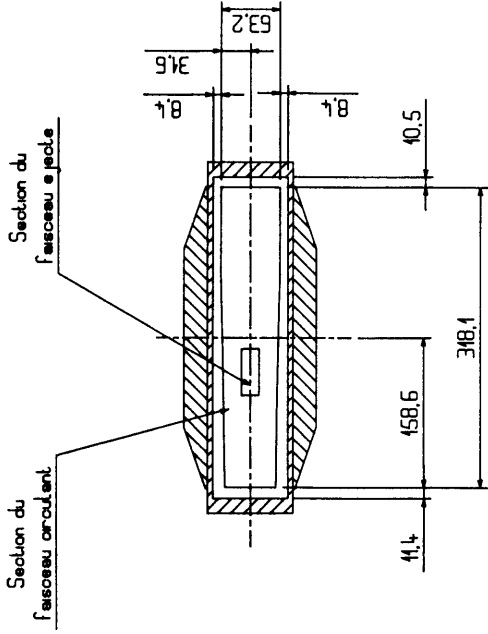


Beam dimensions inside the quadrupoles  
of the AC ring 47

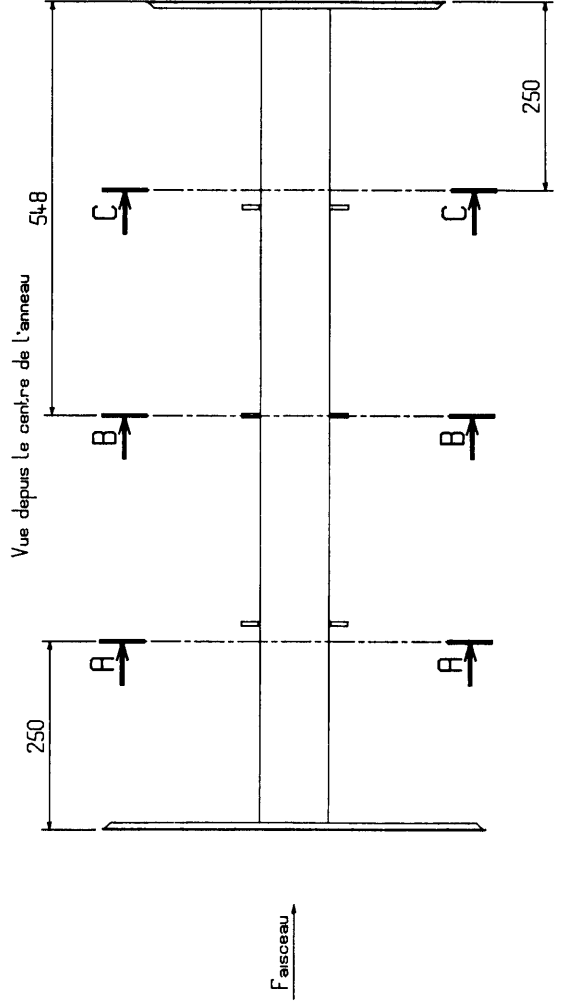
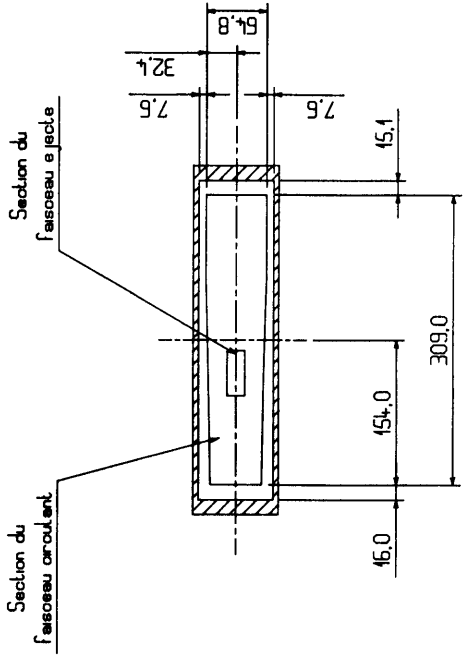
A-A



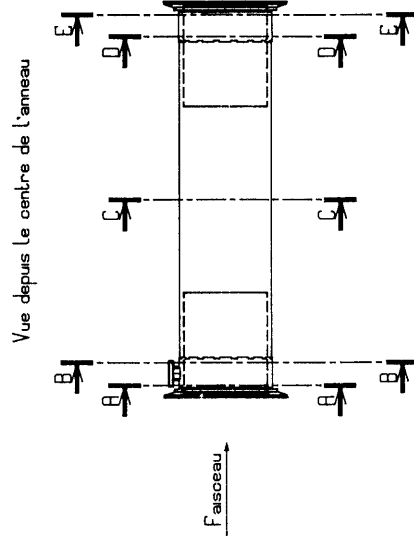
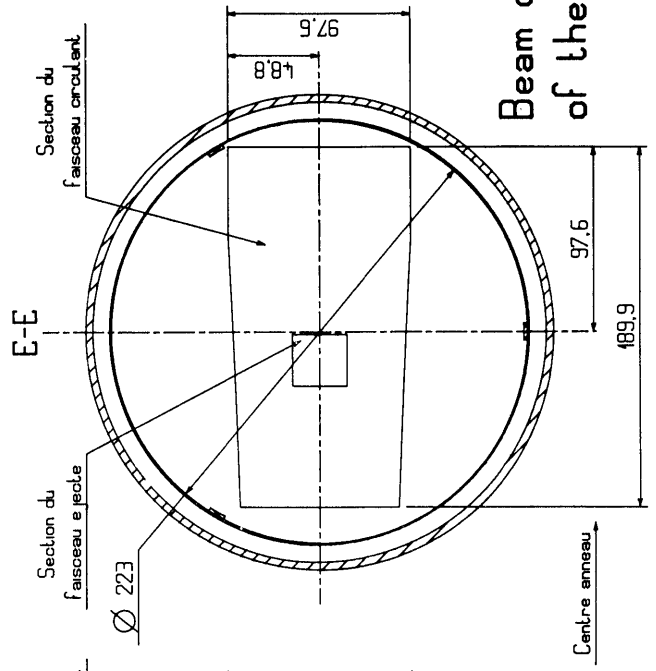
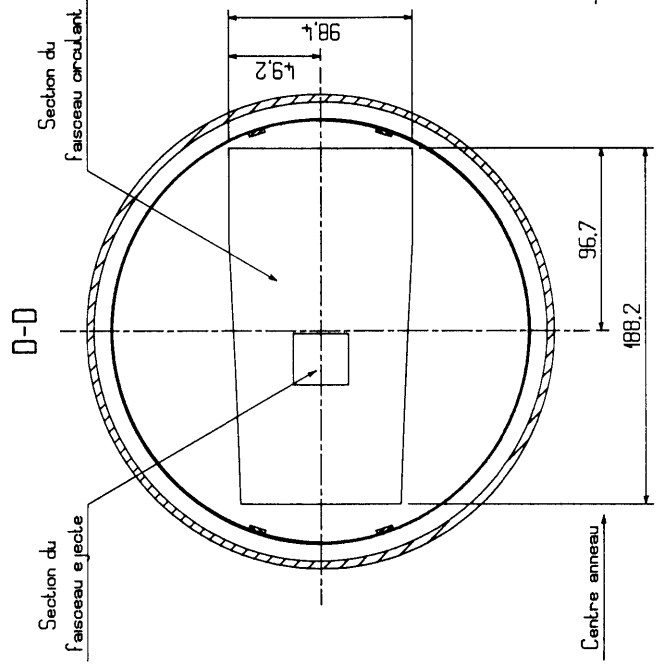
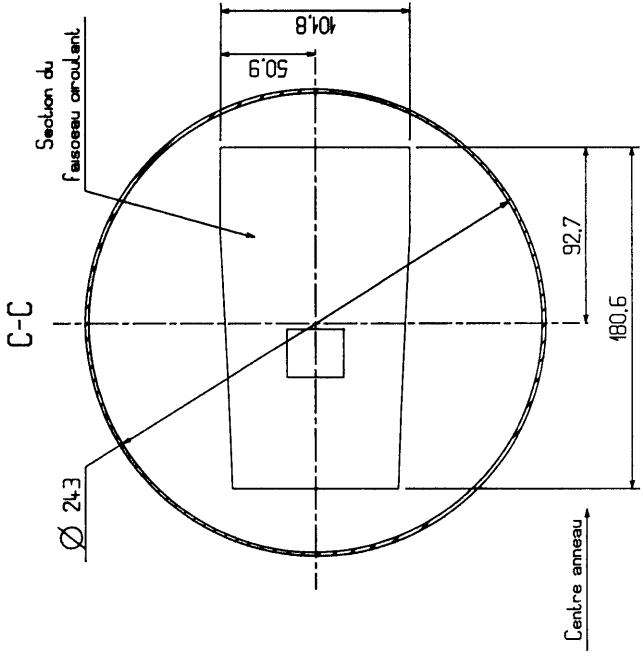
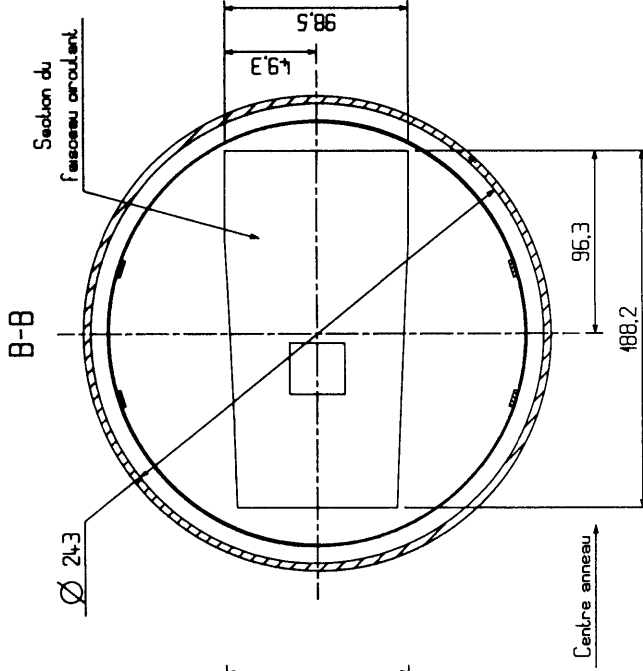
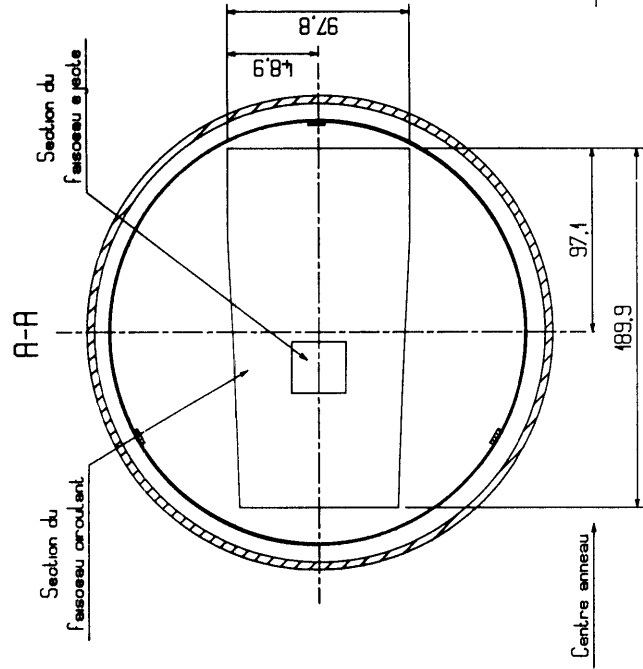
B-B



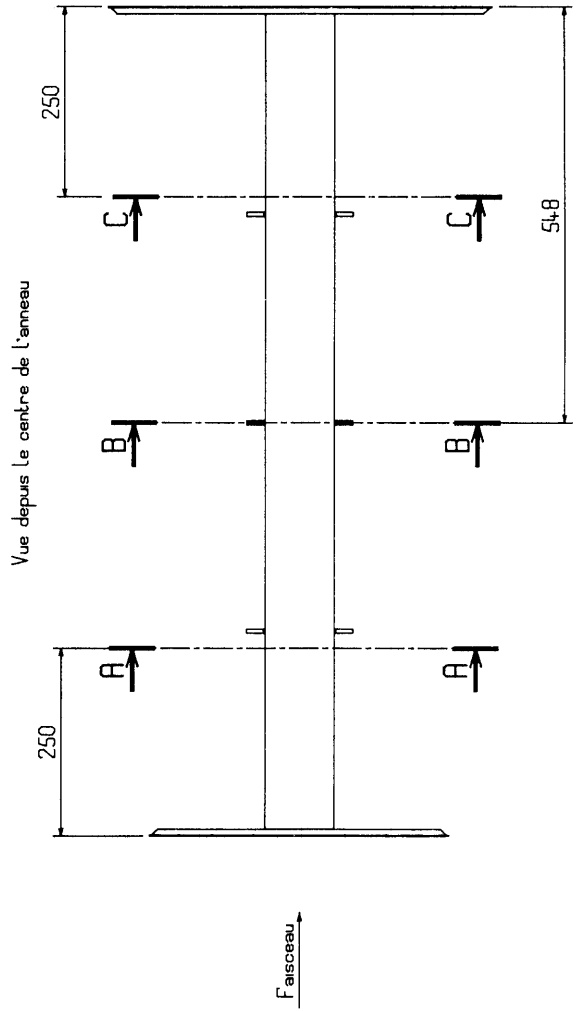
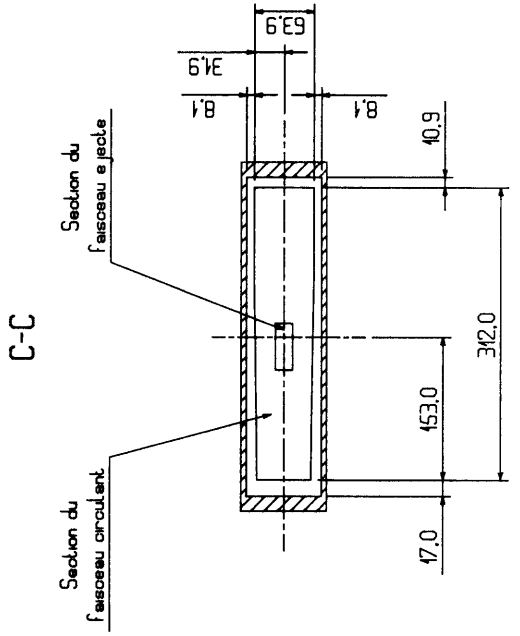
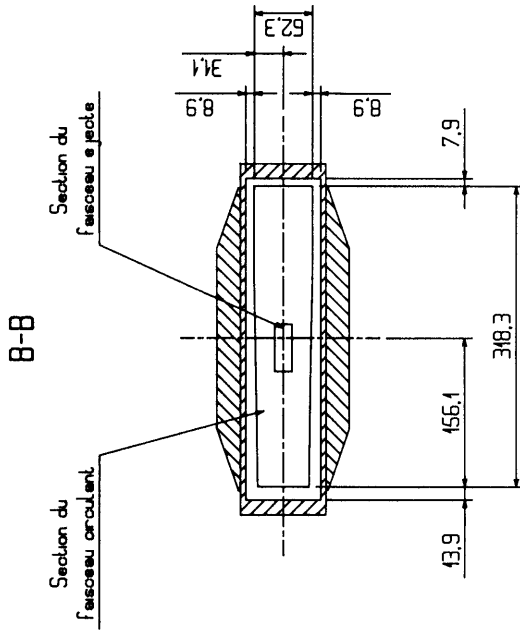
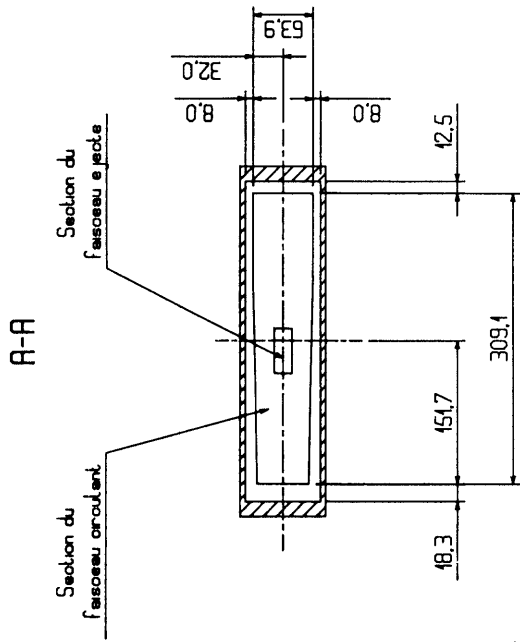
C-C



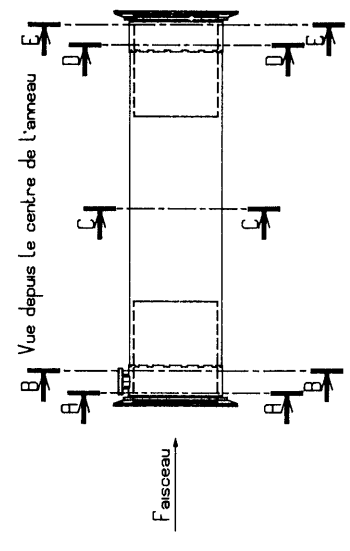
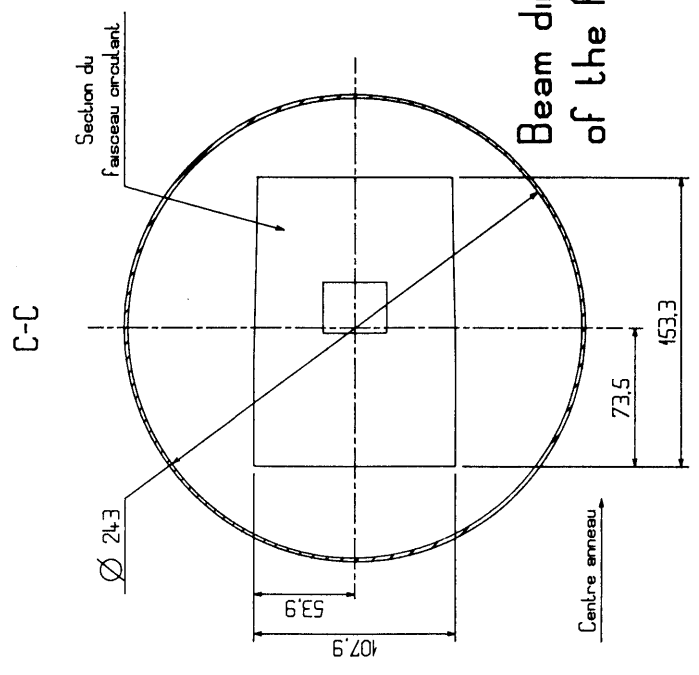
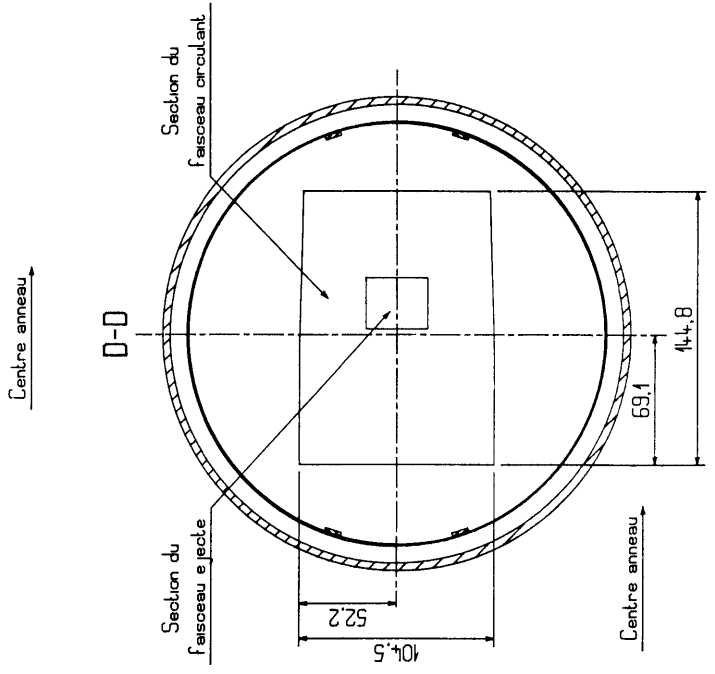
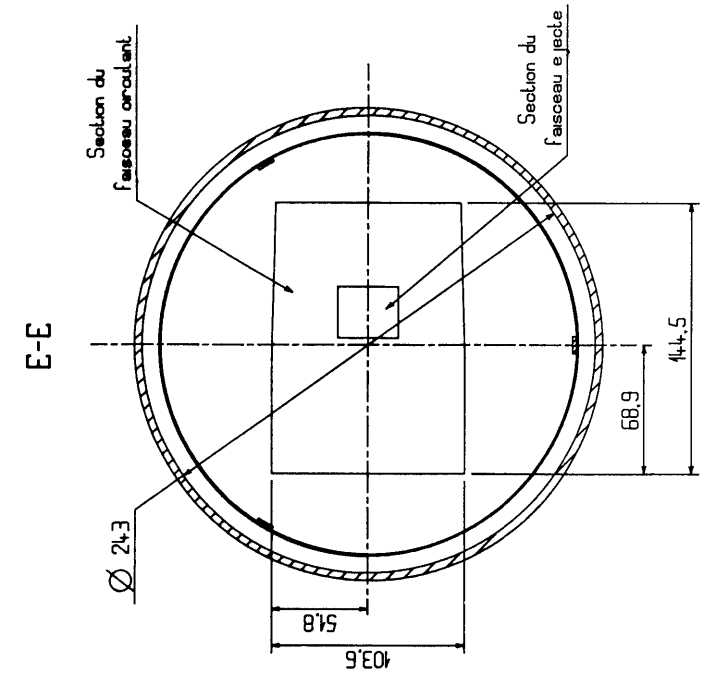
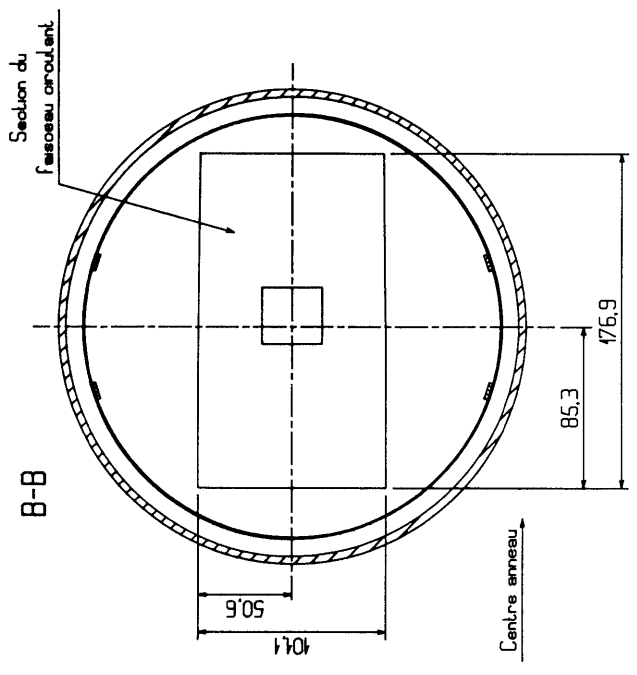
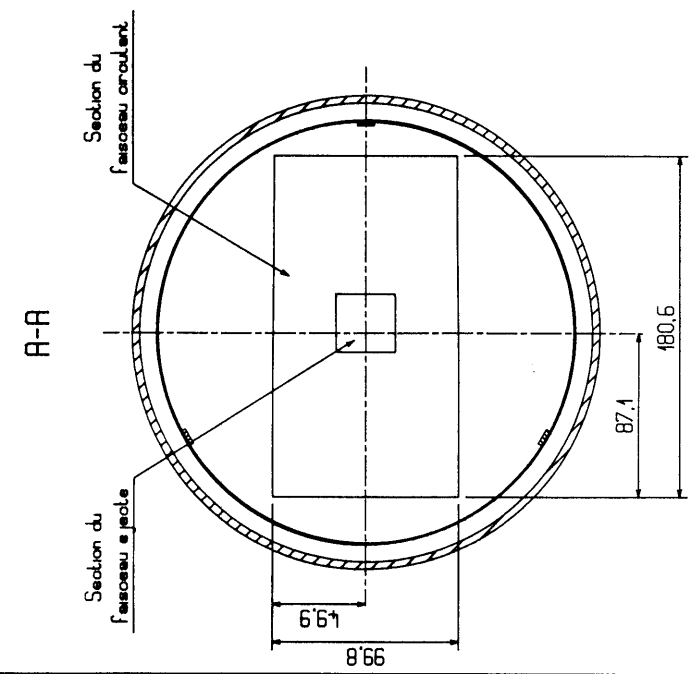
Beam dimensions inside the quadrupoles  
of the AC ring 48



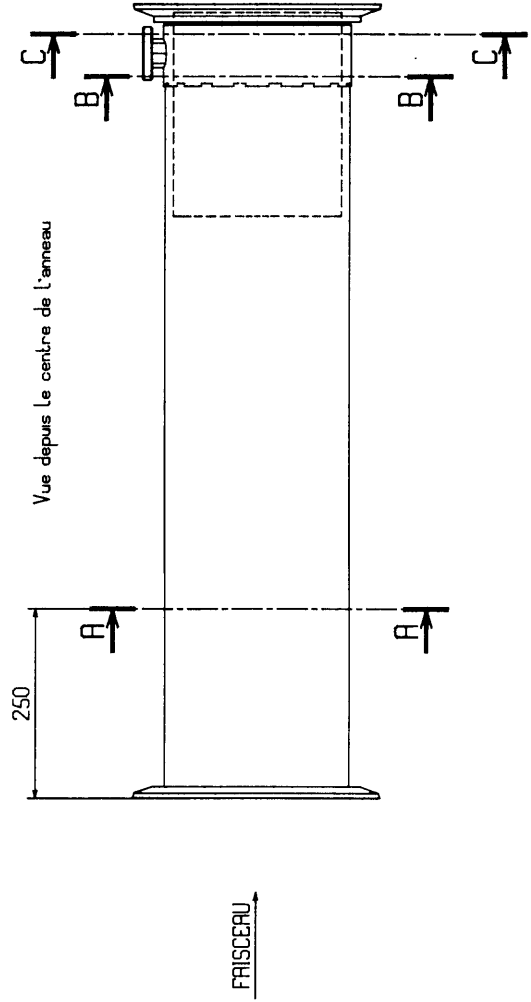
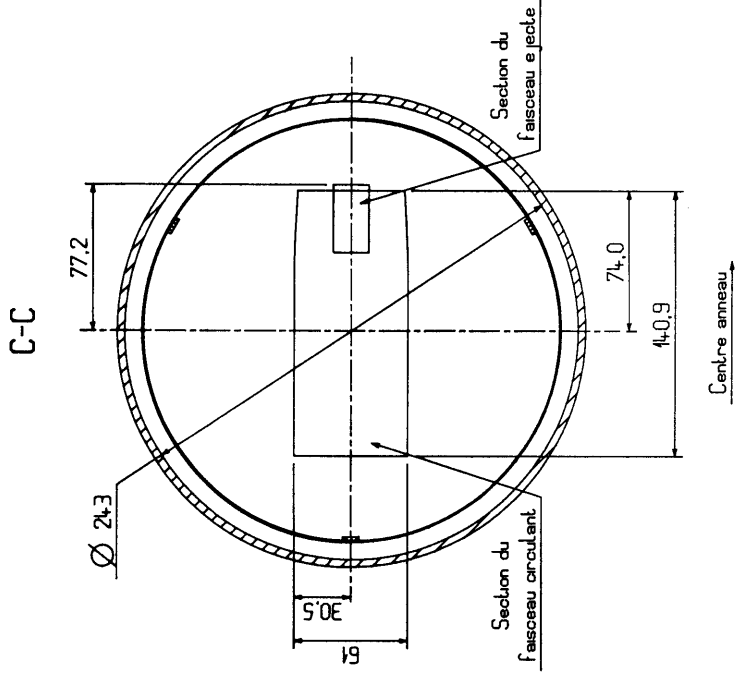
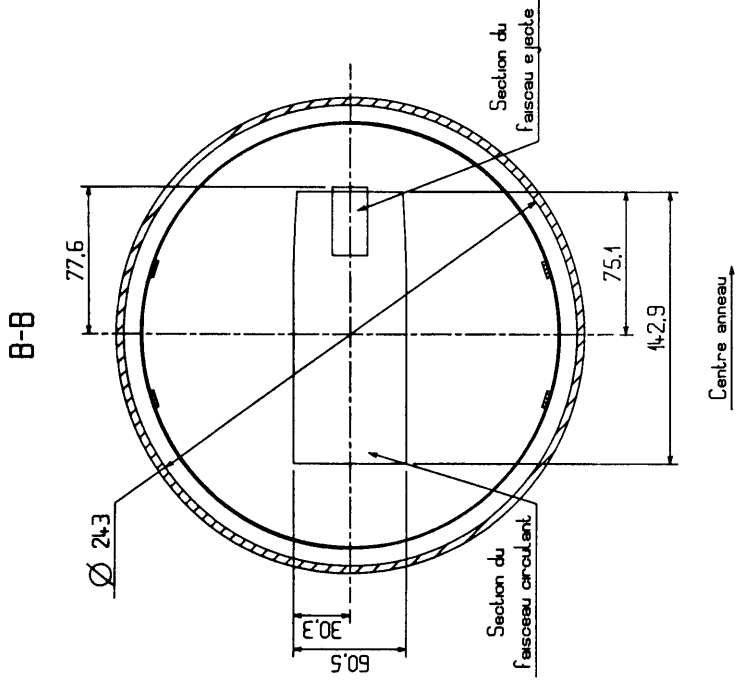
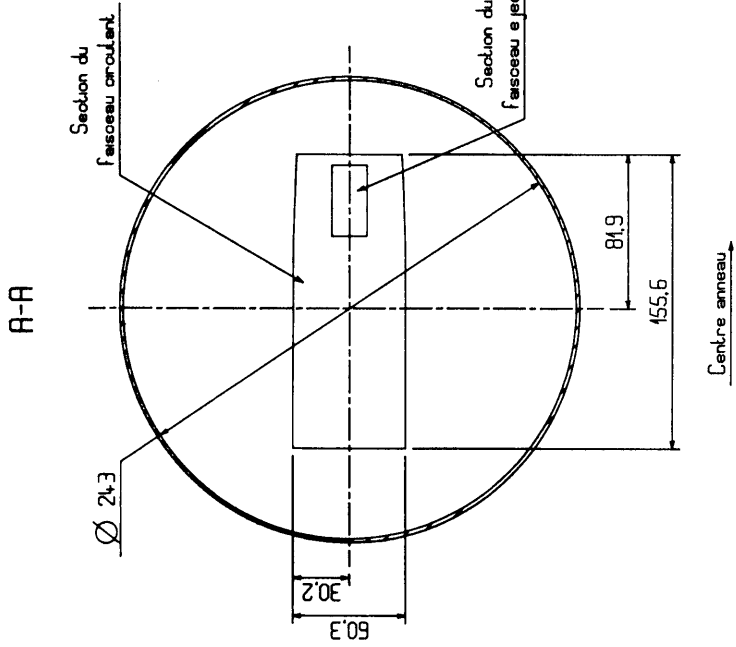
Beam dimensions inside the quadrupoles  
of the AC ring



# Beam dimensions inside the quadrupoles of the AC ring 50

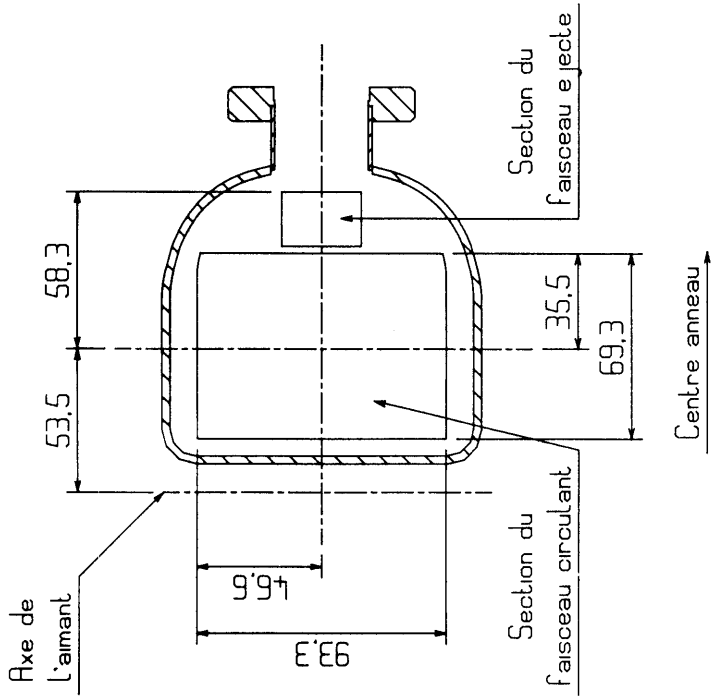


Beam dimensions inside the quadrupoles  
of the AC ring

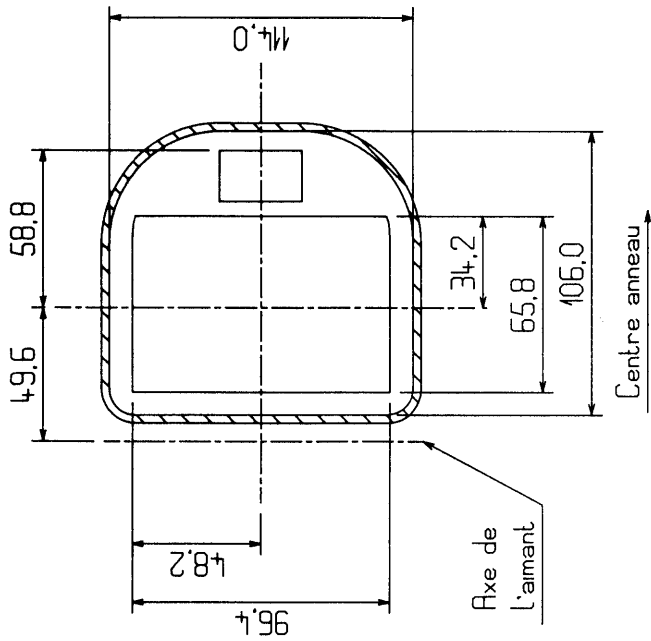


Beam dimensions inside the quadrupoles  
of the AC ring 52

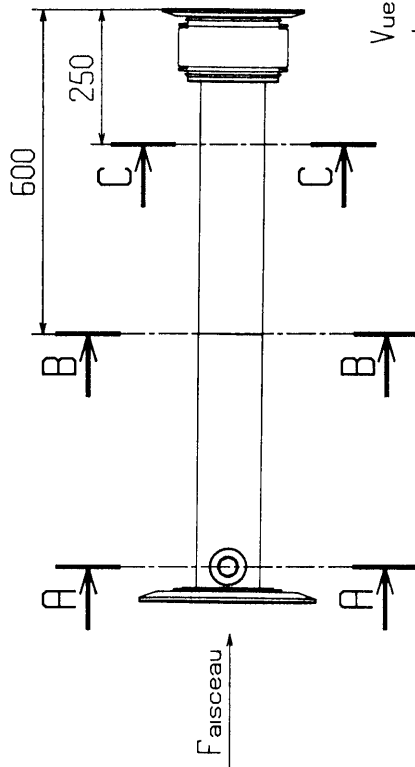
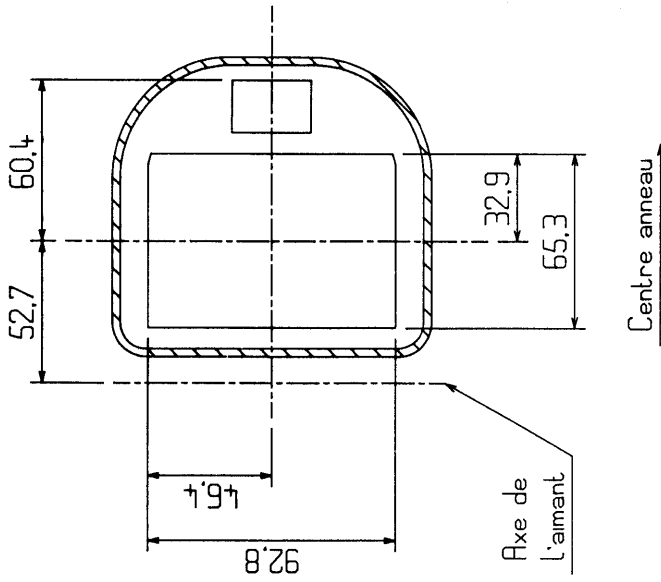
A-A



B-B

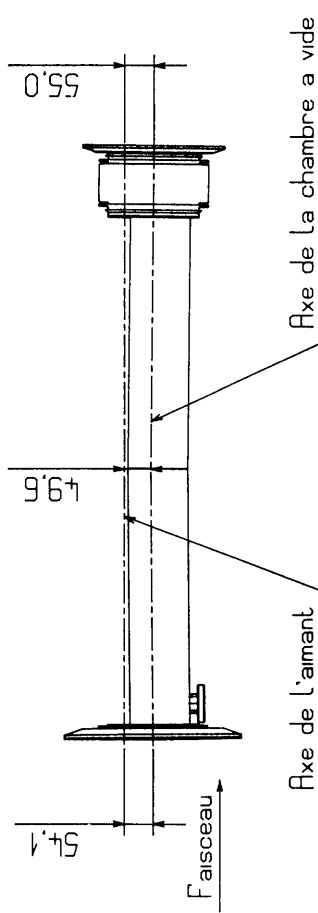


C-C

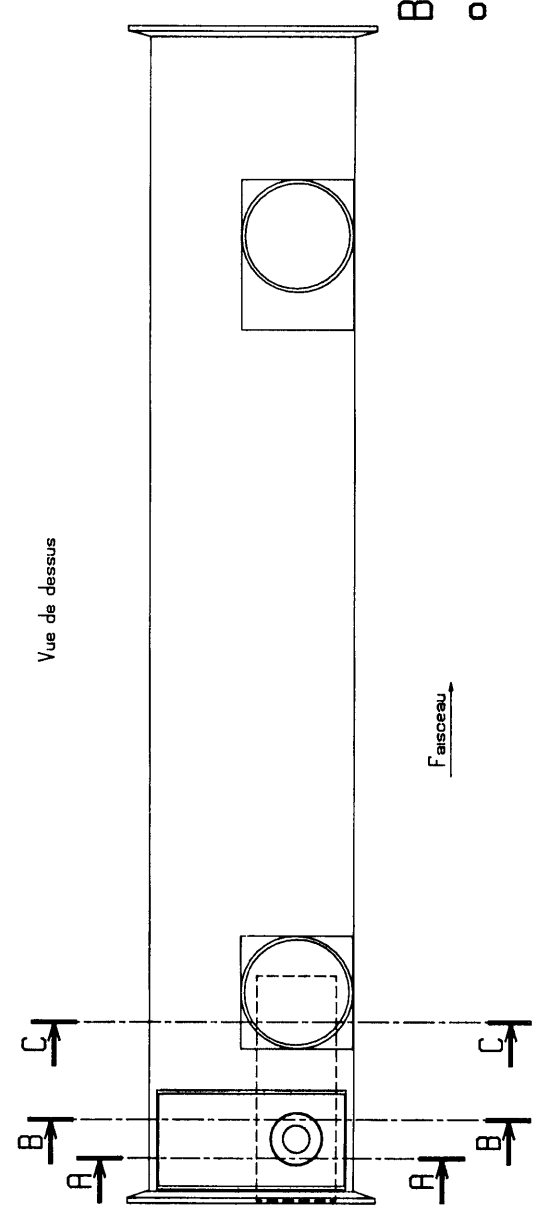
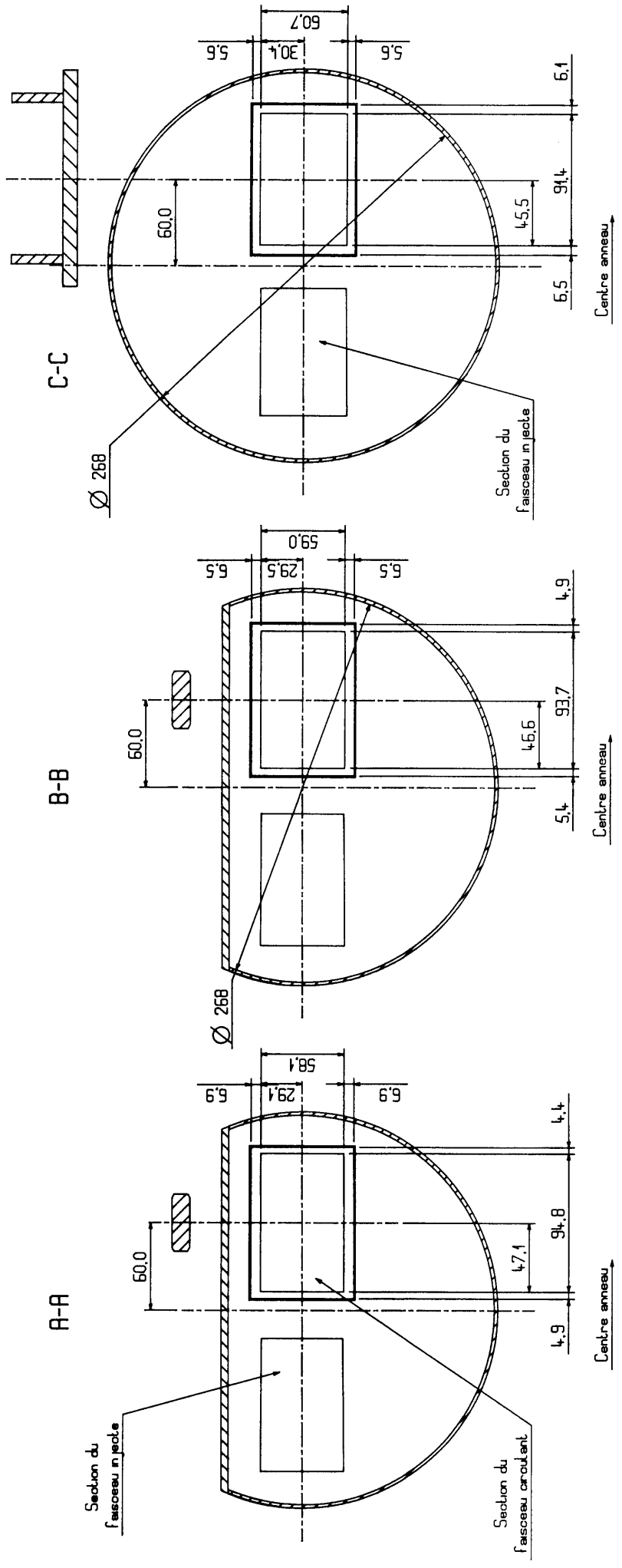


Vue depuis le centre de l'anneau

Vue de dessus



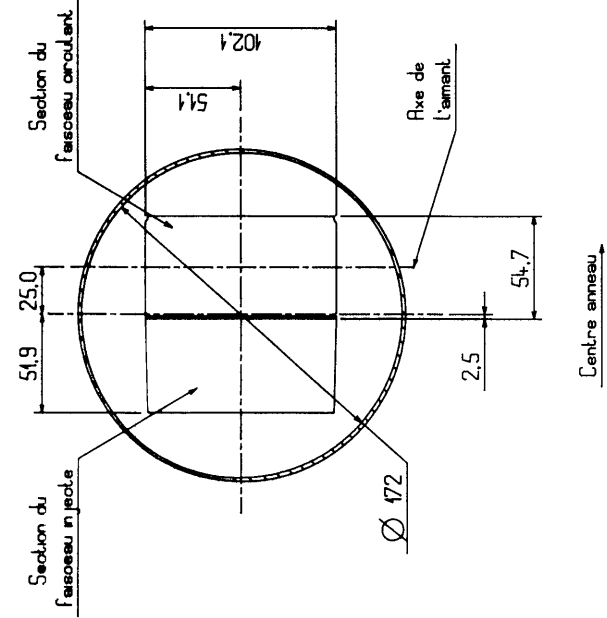
Beam dimensions inside the quadrupoles of the AC ring 53



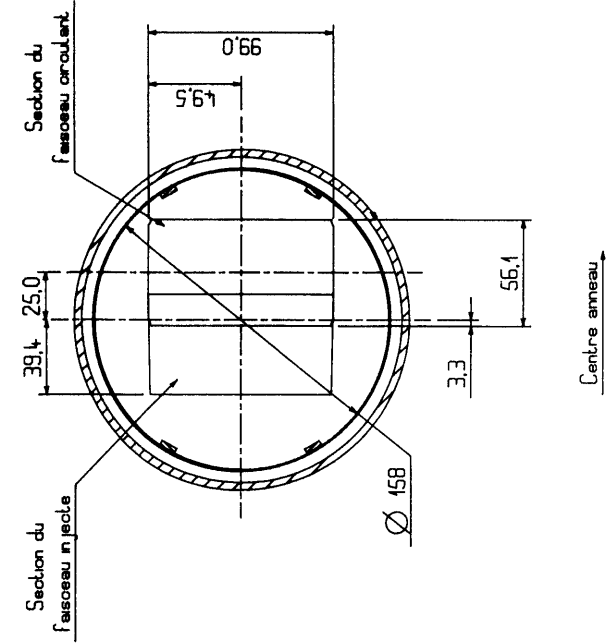
Beam dimensions inside the quadrupoles  
of the AC ring **54**



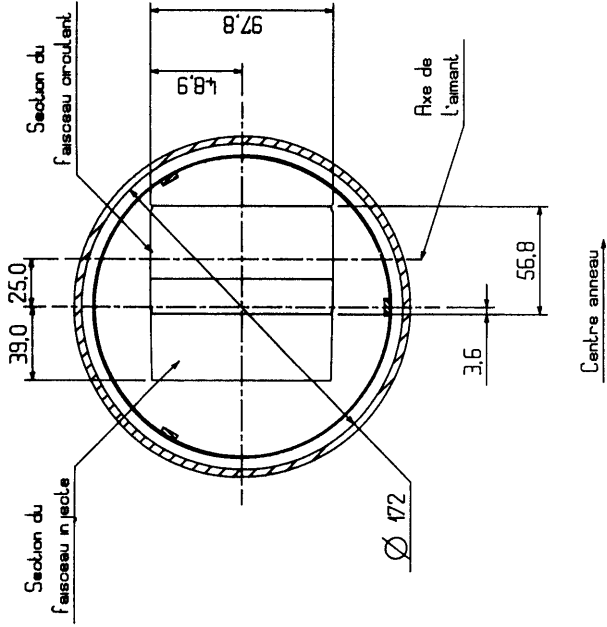
A-A



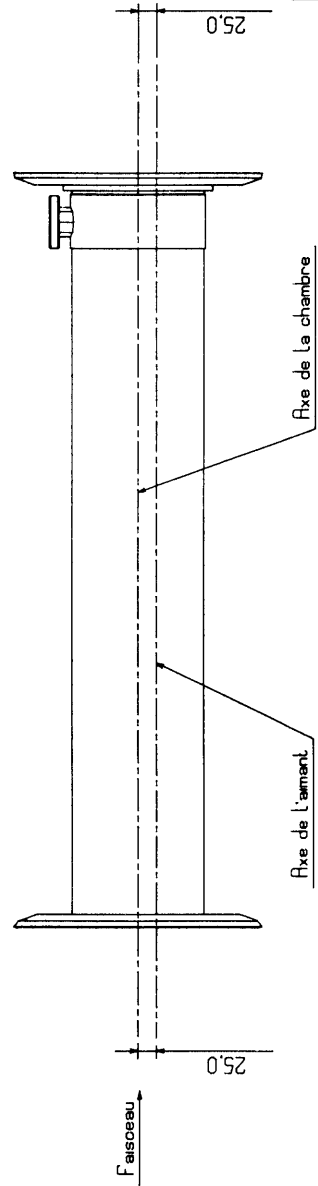
B-B



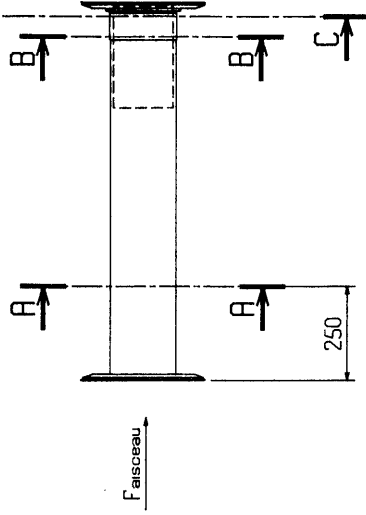
C-C



Vue de dessus

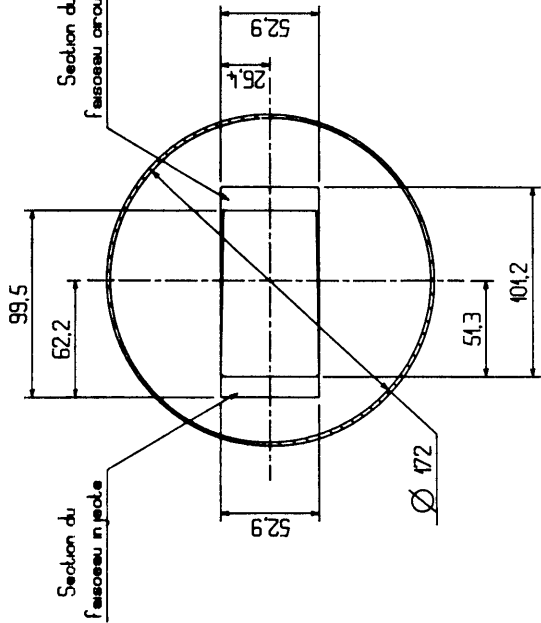


Vue depuis le centre de l'anneau



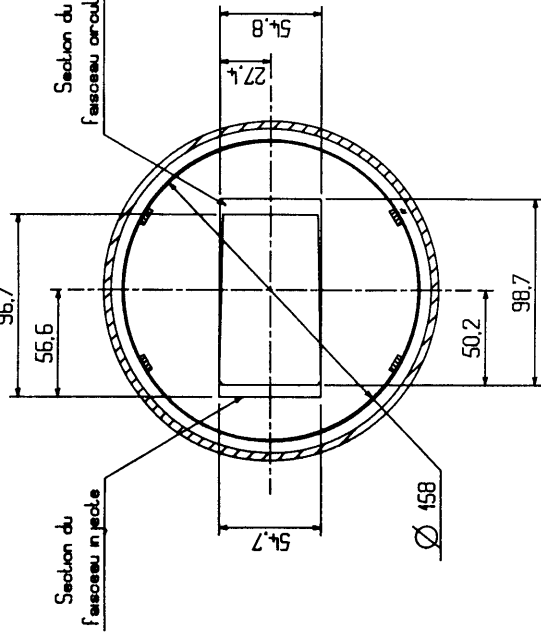
# Beam dimensions inside the quadrupoles of the AC ring 55

A-A



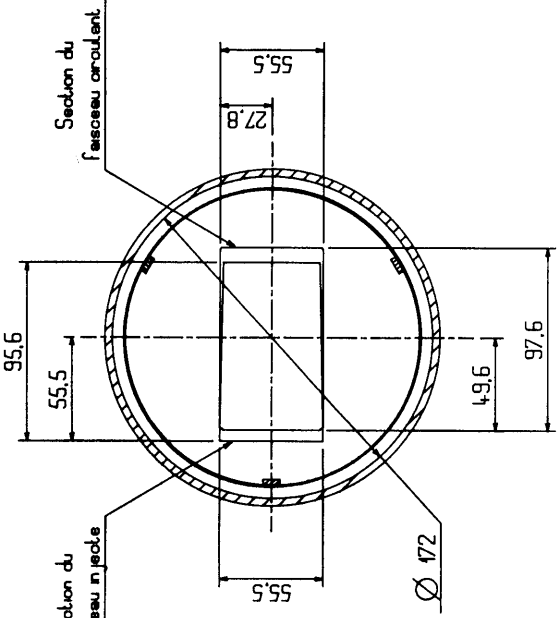
Centre anneau

B-B

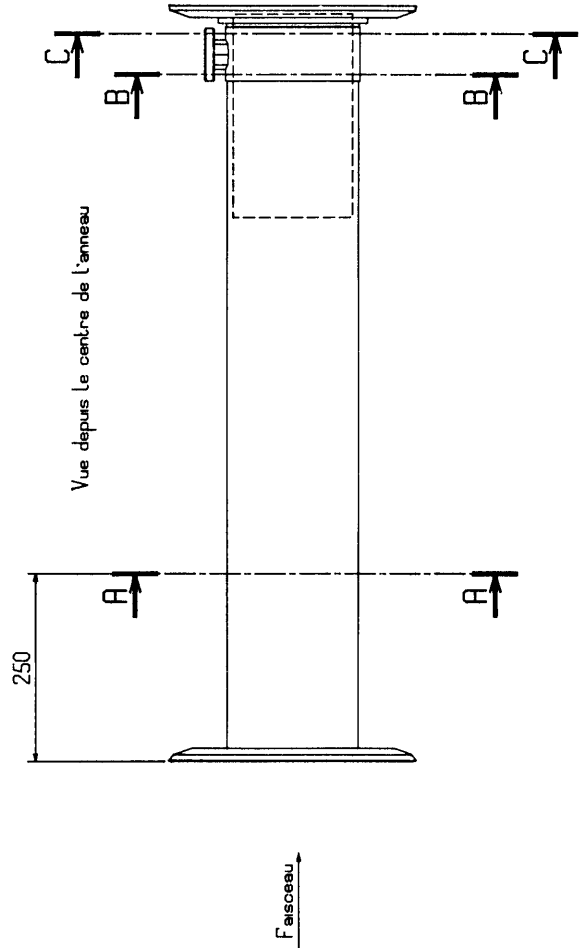


Centre anneau

C-C



Centre anneau



# Beam dimensions inside the quadrupoles of the AC ring 56