MCBXF series production at CIEMAT & CERN
Update March 2024

HL-LHC WP3

Outline

- MCBXF present status at CERN
- Detailed status: Components and tooling
- Planning

MCBXF present status at CERN

- Organization:

WP3 Project engineer: J.C. Perez

- Magnet assembly activities:
    - **Gonzalo Hernando**
    - Sebastien Luzieux (TE-MSC-LMF)
    - Jose Ferradas
    - 1 technician to complete the team (hiring on-going)
    - Support from LMF and SMT (yoking, connections, electrical & magnetic measurements, etc): Karim already identified.

    - For MCBXFB05 and MCBXFA1, Nicholas Eyraud will help in the assembly!

- Production follow-up, controls and documentation: Jose Ferradas and Gonzalo Hernando.

MCBXF present status at CERN

- Activities at CERN resumed during the first working week of 2024. They were structured in 3 main axes:

Identification, control and storage of the magnet components. Documentation!

Setup of the required infrastructure in B.180 and B.927. Planning!

Repairs and modifications on assembly tooling (based on previous exp.). Design of new required tooling.
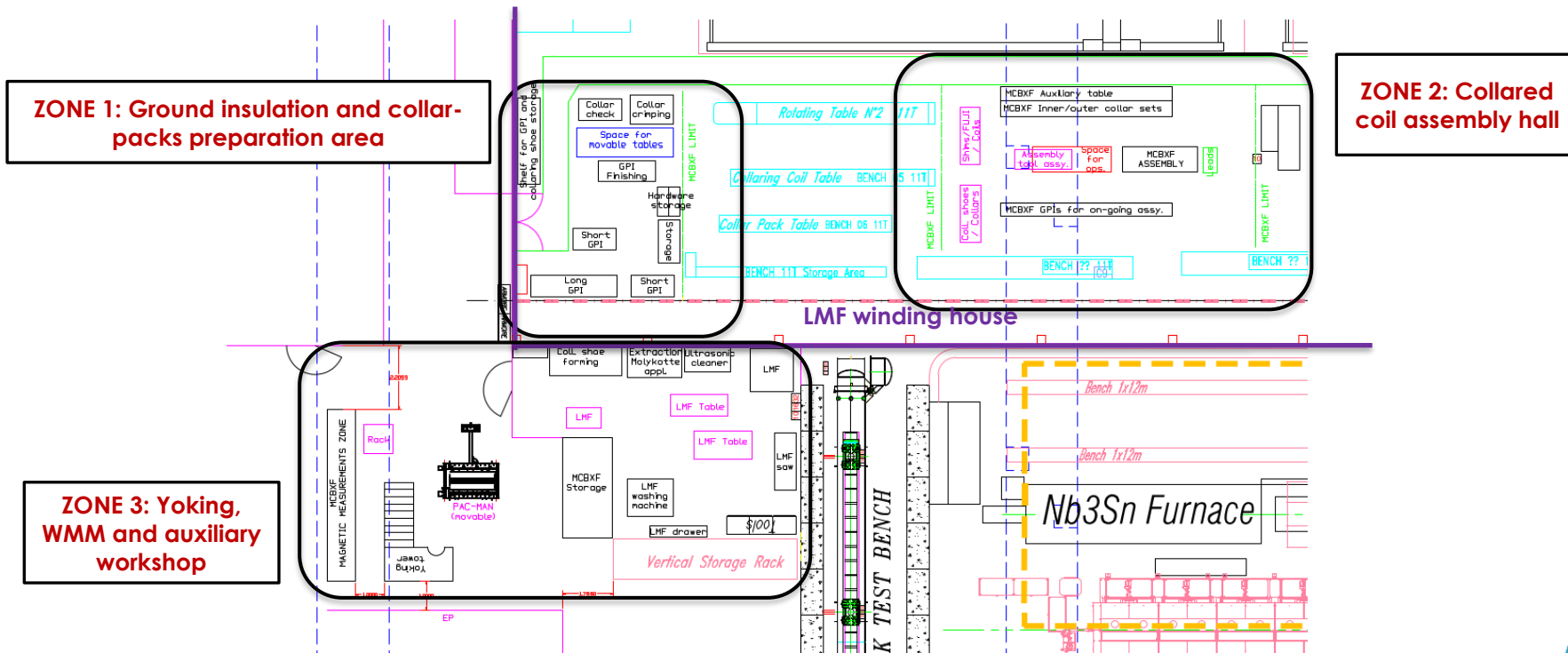
New part to fit the screw and the bearing
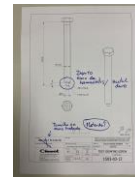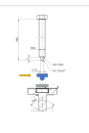
Setup of the required infrastructure

- All assembly operations but the Collaring will be performed in Build. 180: 3 zones for MCBXF.

ZONE 1: Ground insulation and collar-packs preparation area

ZONE 2: Collared coil assembly hall

ZONE 3: Yoking, WMM and auxiliary workshop

LMF winding house

Setup of the required infrastructure

ZONE 1: Ground insulation and collar-packs preparation area
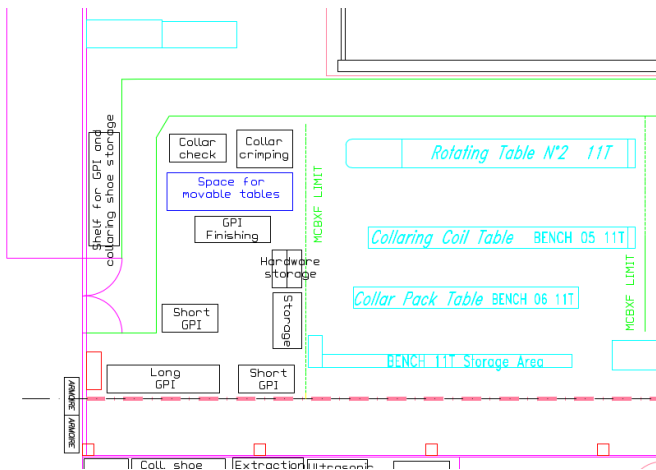
Setup of the required infrastructure

ZONE 2: Collared coil assembly hall

Setup of the required infrastructure

ZONE 3: Yoking, WMM and auxiliary workshop
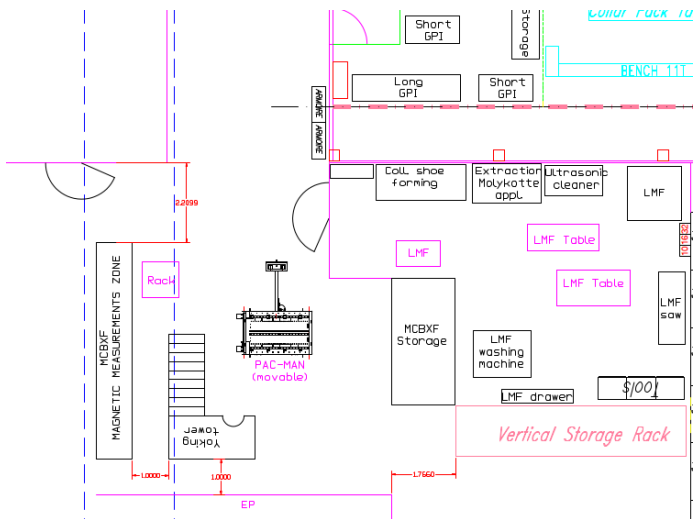
Detailed status: Components and tooling
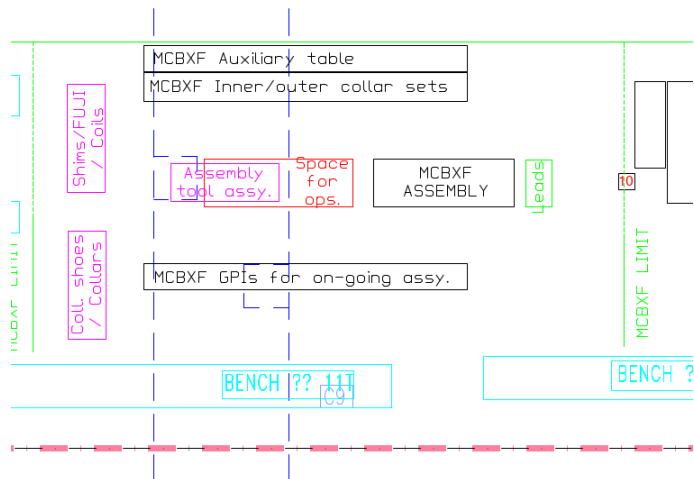
- Update regarding tooling:

  - Designed and assembled a transport trolley for MCBXF collared coils (needed for moving collared coils between B.927 and B.180)

  - Changed hardware (screws and rods) from SS to Black oxide steel:
    - GPI tooling (Quality 8.8)
    - Collaring cradles (pusher screws) (Quality 8.8), Ø to 5 mm
    - Collar crimping tooling (crimping screws) (Quality 10.9)

  - Added a bearing to the collar crimping tooling

  - Replaced stabilization heaters and controllers

  - Ordered a dedicated hydraulic system for MCBXF yoking

Detailed status: Components and tooling

- <u>Update regarding tooling:</u>

  - Collaring cradles for MCBXFB inspected and ready next to the collaring press

  - Boxes with collaring cradles for MCBXFA have been opened. The tooling will be assembled as soon as we have some spare time.

  - We have recovered all tooling boxes except:
    - MCBXFA assembly tooling
    - Yoking (partially)
    - WMM (partially)

Detailed status: Components and tooling

- <u>Update regarding components:</u>

  - Folded GPIs:
    - GPI sets for MCBXFB05 and 06 have been checked (they are complete and OK)
    - GPI sets for MCBXFB07 and 08 will be checked in the following days
    - GPI set for MCBXFA1 has been checked (complete and OK)
    - GPI set for MCBXFA2 is at 40%

  - Collaring shoes:
    - MCBXFB: We have stock for 4 magnets, **BUT ONLY INNER! (zero stock for outer)**
    - MCBXFA: We have in stock for 2 full magnets

COMPONENTE	CANTIDAD	NOTAS	
INNER COLLARING SHOES cortos	8 unidades de cada	medidos, revisados y limados	trazabilidad indicada en cada embalaje
piezas sueltas inner collaring shoes cortos			
11	2	sin limar	
12	2 .+ 1NO OK		trazabilidad no indicada. Pertenecen al lote anterior a los dos indicados aqui
14	2		
INNER COLLARING SHOES largos	4 unidades de cada	medidos, revisados y limados	trazabilidad indicada
OUTER COLLARING SHOES largos	4 unidades de cada	medidos, revisados y limados	trazabilidad indicada

We need CIEMAT to send us collaring shoe sheets in order to complete our stock.

Detailed status: Components and tooling

- **Update regarding components:**

  - Unfolded GPI:
    - We have stock for the following MCBXFB inner dipole sets:
      - 3x SET1 (pole)
      - 4x SET2 (pole)
      - 13x MIDPLANE
    - We have stock for the following MCBXFB outer dipole sets:
      - 5x MIDPLANE

    - **We do not have stock for MCBXFA sets!**

    We need CIEMAT to send us GPI layers in order to complete our stock.

Detailed status: Components and tooling

- Collar sets:
  - Crimped collar sets are available for
    - MCBXFB05 (checked)
    - MCBXFB06 (not checked)
    - MCBXFA1 (not checked)

  - Collars have been already separated (not crimped) for:
    - MCBXFB07 (not checked)
    - MCBXFB08 (not checked)

  - Instrumented collar sets are being inspected by EN-MME in B.180

MCBXFB05

- ## Collar sets:
  - We re-measured the collar sets for MCBXFB05

INNER DIPOLE

SET Nº	COLLARS (& FASTENERS) TRACEABILITY		RIVETS TRACEABILITY		Design	WIDTH Poka-Yoke	Non Poka-Yoke
A01	1901-05-C8: 14 unidades 1901-05-C9: 14 unidades	6 6	2203-05-R28: 2 unidades	05-04-2022 12.26	89.4	89.66	89.57
A02	1901-05-C8: 14 unidades 1901-05-C9: 14 unidades	6 (9 u) 15 6 (10 u) 15	2203-05-R28: 2 unidades	05-04-2022 12.26	89.4	89.52	89.55
A03	1901-05-C1: 11 unidades 1901-05-C2: 11 unidades 1901-05-C8: 3 unidades	20 18 15	2203-05-R31: 2 unidades	05-04-2022 12.26	99	99.19	99.18
A04	1901-05-C1: 8 unidades 1901-05-C2: 8 unidades	21 19	1901-05-R16: 2 unidades	05-04-2022 12.26	51	51.00	51.10
A05	1901-05-C1: 10 unidades 1901-05-C2: 10 unidades	C1: B39 (10u) C2: B34 (10u)	2203-05-R20: 2 unidades	05-04-2022 12.26	63.8	63.05	62.95
A06	1901-05-C1: 10 unidades 1901-05-C2: 10 unidades	22 39	2203-05-R20: 2 unidades	05-04-2022 12.26	63.8	63.87	63.80
A07	1901-05-C1: 10 unidades 1901-05-C2: 10 unidades	22 39	2203-05-R20: 2 unidades	05-04-2022 12.26	63.8		
A08	1901-05-C1: 10 unidades 1901-05-C2: 10 unidades	22 (3) 23 39	2203-05-R20: 2 unidades	05-04-2022 12.26	63.8	63.81	63.73
A09	1901-05-C1: 7 unidades 1901-05-C2: 7 unidades 1901-05-CA: 1 unidad	23 40 24	1901-05-R16: 2 unidades	05-04-2022 12.26	51	51.09	51.11
A10	1901-05-C1: 10 unidades 1901-05-C2: 10 unidades	C1: B40 (10u) C2: B35 (10u)	2203-05-R20: 2 unidades	05-04-2022 12.26	63.8	62.95	62.88
A11	1901-05-C1: 10 unidades 1901-05-C2: 10 unidades	45 (6) 46 41	2203-05-R20: 2 unidades	05-04-2022 12.26	63.8		
A12	1901-05-C1: 10 unidades 1901-05-C2: 10 unidades	C1: B41 (10u) C2: B35 (10u)	2203-05-R20: 2 unidades	05-04-2022 12.26	63.8	62.72	62.52
A13	1901-05-C1: 10 unidades 1901-05-C2: 10 unidades	46 41 (3) 42	2203-05-R20: 2 unidades	05-04-2022 12.26	63.8	63.88	63.72
A14	1901-05-C1: 8 unidades 1901-05-C2: 8 unidades	21 19	1901-05-R16: 2 unidades	05-04-2022 12.26	51	51.07	51.07
A15	1901-05-C1: 11 unidades 1901-05-C2: 11 unidades 1901-05-C8: 4 unidades	46 42 15	2203-05-R31: 2 unidades	05-04-2022 12.26	99	99.21	99.21
A16	1901-05-C8: 14 unidades 1901-05-C9: 14 unidades	14 (3) 15 14 (4) 15	2203-05-R28: 2 unidades	05-04-2022 12.26	89.4	89.50	89.55
A17	1901-05-C8: 14 unidades 1901-05-C9: 14 unidades	15 15	2203-05-R28: 2 unidades	05-04-2022 12.26	89.4	89.50	89.58

dif	Poka-Yoke	Non Poka-Yoke
0.09	0.26	0.17
-0.03	0.12	0.15
0.01	0.19	0.18
-0.10	0.00	0.10
0.10	-0.75	-0.85
0.07	0.07	0.00
0.00		
0.08	0.01	-0.07
-0.02	0.09	0.11
0.07	-0.85	-0.92
0.00		
0.20	-1.08	-1.28
0.16	0.08	-0.08
0.00	0.07	0.07
0.00	0.21	0.21
-0.05	0.10	0.15
-0.08	0.10	0.18

						Design	Poka-Yoke	Non Poka-Yoke
B01	1901-05-C8: 12 unidades 1901-05-C9: 12 unidades	6 6	2203-05-R24: 2 unidades	05-04-2022 12.26		76.6	76.40	76.49
B02	1901-05-C8: 14 unidades 1901-05-C9: 14 unidades	14 14	2203-05-R28: 2 unidades	05-04-2022 12.26		89.4	89.33	89.59
B03	1901-05-C1: 9 unidades 1901-05-C2: 9 unidades 1901-05-C8: 6 unidades	20 18 15	2203-05-R31: 2 unidades	05-04-2022 12.26		99	99.18	99.17
B04	1901-05-C1: 12 unidades 1901-05-C2: 12 unidades	20 (7) 21 18 (5) 19	1901-05-R24: 2 unidades	05-04-2022 12.26		76.6	76.60	76.59
B05	1901-05-C1: 12 unidades 1901-05-C2: 12 unidades	21 19	2203-05-R24: 2 unidades	05-04-2022 12.26		76.6	76.66	76.58
B06	1901-05-C1: 12 unidades 1901-05-C2: 12 unidades	21 19	2203-05-R24: 2 unidades	05-04-2022 12.26		76.6		
B07	1901-05-C1: 11 unidades 1901-05-C2: 11 unidades 1901-05-CA: 1 unidad	22 39 15	2203-05-R24: 2 unidades	05-04-2022 12.26		76.6	77.40	77.45
B08	1901-05-C1: 12 unidades 1901-05-C2: 12 unidades	23 39 (2) 40	1901-05-R24: 2 unidades	05-04-2022 12.26		76.6	77.15	77.25
B09	1901-05-C1: 12 unidades 1901-05-C2: 12 unidades	23 (11) 44 41	2203-05-R24: 2 unidades	05-04-2022 12.26		76.6	76.77	76.61
B10	1901-05-C1: 12 unidades 1901-05-C2: 12 unidades	44 41	2203-05-R24: 2 unidades	05-04-2022 12.26		76.6		
B11	1901-05-C1: 12 unidades 1901-05-C2: 12 unidades	44 (3) 45 42	2203-05-R24: 2 unidades	05-04-2022 12.26		76.6	76.76	76.60
B12	1901-05-C1: 12 unidades 1901-05-C2: 12 unidades	47 42	1901-05-R24: 2 unidades	05-04-2022 12.26		76.6	76.75	76.74
B13	1901-05-C1: 9 unidades 1901-05-C2: 9 unidades 1901-05-C8: 5 unidades	47 42 (8) 43 15	2203-05-R31: 2 unidades	05-04-2022 12.26		99	99.59	99.50
B14	1901-05-C8: 14 unidades 1901-05-C9: 14 unidades	15 (7) 16 15 (8) 16	2203-05-R28: 2 unidades	05-04-2022 12.26		89.4	89.40	89.56
B15	1901-05-C8: 12 unidades 1901-05-C9: 12 unidades	C8: B13 (12u) C9: B13 (12u)	2203-05-R24: 2 unidades	05-04-2022 12.26		76.6	76.64	76.73

	Design	Poka-Yoke	Non Poka-Yoke
Collar with nose except A07 & A11	733.8	731.84	731.27
Collar with nose except B06 & B10	734.2	736.86	736.49
Remove 2 collars in A07 & B06, or in A11 & B10			
Collar w/nose (A03-A15)	861.4	731.84	731.27
Collar w/nose (B03-B13)	887.4	736.86	736.49
Total A-Collars (A01-A17)	1219	1090.02	1089.52
Total B-Collars (B01-B15)	1219.4	1068.63	1068.86

-0.09	-0.20	-0.11	
-0.26	-0.07	0.19	
0.01	0.18	0.17	
0.01	0.00	-0.01	
0.08	0.06	-0.02	
0.00			
-0.05	0.80	0.85	
-0.10	0.55	0.65	
0.16	0.17	0.01	
0.00			
0.16	0.16	0.00	
0.01	0.15	0.14	
0.09	0.59	0.50	
-0.16	0.00	0.16	
-0.09	0.04	0.13	2.66	2.29
	-1.96	-2.53	
	2.66	2.29	

MCBXFB05

OUTER DIPOLE

C-Collars

SET Nº	COLLARS TRACEABILITY	RIVETS TRACEABILITY		(date)	WIDTH Design	Poka-Yoke	Non Poka-Yoke	dif	Poka-Yoke	Non Poka-Yoke
C01	1901-06-C8: 13 unidades / 1901-06-C7: 13 unidades	8 (9) 9 / 9	2203-05-R26: 2 unidades	05-04-2022 12.26	83	83.15	83.26	-0.11	0.15	0.26
C02	1901-06-C8: 12 unidades / 1901-06-C7: 12 unidades	10 / 11	2203-05-R24: 2 unidades	05-04-2022 12.26	76.6	76.55	76.72	-0.17	-0.05	0.12
C03	1901-06-C8: 12 unidades / 1901-06-C7: 12 unidades	10 (7) 20 / 11 (4) 24	2203-05-R24: 2 unidades	05-04-2022 12.26	76.6	76.62	76.93	-0.31	0.02	0.33
C04	1901-06-C1: 12 unidades / 1901-06-C2: 12 unidades / 1901-06-C8: 4 unidades	50 / 40 / 21	2203-05-R31: 2 unidades	24-01-2023 10.16	99	99.40	99.60	-0.20	0.4	0.60
C05	1901-06-C7: 8 unidades / 1901-06-C2: 8 unidades	35 / 34	1901-05-R16: 2 unidades	05-04-2022 12.26	51	51.30	51.70	-0.40	0.3	0.70
C06	1901-06-C1: 10 unidades / 1901-06-C2: 10 unidades	50 (2) 51 / 46	2203-05-R20: 2 unidades	05-04-2022 12.26	63.8	63.65	63.90	-0.25	-0.15	0.10
C07	1901-06-C1: 10 unidades / 1901-06-C2: 10 unidades	51 / 46	2203-05-R20: 2 unidades	05-04-2022 12.26	63.8	63.85	64.20	-0.35	0.05	0.40
C08	1901-06-C1: 10 unidades / 1901-06-C2: 10 unidades	51 / 46 (5) 47	2203-05-R20: 2 unidades	05-04-2022 12.26	63.8					
C09	1901-06-C1: 10 unidades / 1901-06-C2: 10 unidades	51 / 47		05-04-2022 12.26	63.8	64.20	64.60	-0.40	0.4	0.80
C10	1901-06-C1: 8 unidades / 1901-06-C2: 8 unidades	51 (2) 52 / 47	1901-05-R16: 2 unidades	05-04-2022 12.26	51	51.19	51.70	-0.51	0.19	0.70
C11	1901-06-C1: 10 unidades / 1901-06-C2: 10 unidades	52 / 47	2203-05-R20: 2 unidades	05-04-2022 12.26	63.8	64.24	64.00	0.24	0.44	0.20
C12	1901-06-C1: 10 unidades / 1901-06-C2: 10 unidades	53 / 48	2203-05-R20: 2 unidades	05-04-2022 12.26	63.8					
C13	1901-06-C1: 10 unidades / 1901-06-C2: 10 unidades	53 / 48	2203-05-R20: 2 unidades	05-04-2022 12.26	63.8	64.35	64.70	-0.35	0.55	0.90
C14	1901-06-C1: 10 unidades / 1901-06-C2: 10 unidades	53 / 48	2203-05-R20: 2 unidades	05-04-2022 12.26	63.8	64.30	64.80	-0.50	0.5	1.00
C15	1901-06-C7: 8 unidades / 1901-06-C2: 8 unidades	54 / 49	1901-05-R16: 2 unidades	05-04-2022 12.26	51	51.50	51.50	0.00	0.5	0.50
C16	1901-06-C1: 12 unidades / 1901-06-C2: 12 unidades / 1901-06-C7: 4 unidades	54 / 49 / 25	2203-05-R31: 2 unidades	24-01-2023 10.16	99	99.50	99.65	-0.15	0.5	0.65
C17	1901-06-C8: 12 unidades / 1901-06-C7: 12 unidades	24 / 20 (9) 21	2203-05-R24: 2 unidades	05-04-2022 12.26	76.6	76.90	77.10	-0.20	0.3	0.50
C18	1901-06-C8: 12 unidades / 1901-06-C7: 12 unidades	24 / 21	2203-05-R24: 2 unidades	05-04-2022 12.26	76.6	76.65	76.96	-0.31	0.05	0.36
C19	1901-06-C8: 13 unidades / 1901-06-C7: 13 unidades	9 / 9 (3) 10	2203-05-R26: 2 unidades	05-04-2022 12.26	83	82.90	83.23	-0.33	-0.1	0.23

4.05   8.35

D-Collars

SET Nº	COLLARS TRACEABILITY	RIVETS TRACEABILITY		(date)	Design	Poka-Yoke	Non Poka-Yoke	dif	Poka-Yoke	Non Poka-Yoke
D01	1901-06-C7: 11 unidades / 1901-06-C8: 11 unidades	9 / 10	2203-05-R22: 2 unidades	05-04-2022 12.26	70.2	70.10	70.32	-0.22	-0.1	0.12
D02	1901-06-C7: 12 unidades / 1901-06-C8: 12 unidades	10 / 9	2203-05-R24: 2 unidades	05-04-2022 12.26	76.6	76.34	76.71	-0.37	-0.26	0.11
D03	1901-06-C7: 12 unidades / 1901-06-C8: 12 unidades	10 (6) 11 / 11	2203-05-R24: 2 unidades	05-04-2022 12.26	76.6	76.60	76.68	-0.08	0	0.08
D04	1901-06-C1: 12 unidades / 1901-06-C2: 10 unidades / 1901-06-C7: 6 unidades	41 / 25 / 11	2203-05-R31: 2 unidades	24-01-2023 10.16	99	99.32	99.50	-0.18	0.32	0.50
D05	1901-06-C1: 12 unidades / 1901-06-C2: 12 unidades	41 / 39	1901-05-R24: 2 unidades	05-04-2022 12.26	76.6	76.28	77.00	-0.72	-0.32	0.40
D06	1901-06-C1: 12 unidades / 1901-06-C2: 12 unidades	41 (11) 49 / 39 (9) 40	2203-05-R24: 2 unidades	05-04-2022 12.26	76.6	76.60	76.90	-0.50	0	0.30
D07	1901-06-C1: 12 unidades / 1901-06-C2: 12 unidades	49 / 40	2203-05-R24: 2 unidades	05-04-2022 12.26	76.6					
D08	1901-06-C1: 12 unidades / 1901-06-C2: 12 unidades	49 (10) 50 / 40	2203-05-R24: 2 unidades	05-04-2022 12.26	76.6	76.50	76.76	-0.26	-0.1	0.16
D09	1901-06-C1: 12 unidades / 1901-06-C2: 12 unidades	50 / 40 (4) 46	1901-05-R24: 2 unidades	05-04-2022 12.26	76.6	76.40	76.65	-0.25	-0.2	0.05
D10	1901-06-C1: 12 unidades / 1901-06-C2: 12 unidades	50 / 46	2203-05-R24: 2 unidades	05-04-2022 12.26	76.6	76.32	76.72	-0.40	-0.28	0.12
D11	1901-06-C1: 12 unidades / 1901-06-C2: 12 unidades	52 / 47	2203-05-R24: 2 unidades	05-04-2022 12.26	76.6					
D12	1901-06-C1: 12 unidades / 1901-06-C2: 12 unidades	52 / 47 (5) 48	2205-05-R24: 2 unidades	05-04-2022 12.26	76.6	76.66	76.12	0.54	0.06	-0.48
D13	1901-06-C1: 12 unidades / 1901-06-C2: 12 unidades	53 (10) 54 / 48	1901-05-R24: 2 unidades	05-04-2022 12.26	76.6	77.10	76.81	0.29	0.5	0.21
D14	1901-06-C1: 10 unidades / 1901-06-C2: 12 unidades / 1901-06-C7: 5 unidades	48 (1) 49 / 25	2203-05-R31: 2 unidades	24-01-2023 10.16	99	99.33	99.56	-0.23	0.33	0.56
D15	1901-06-C7: 12 unidades / 1901-06-C8: 12 unidades	11 / 10	2203-05-R24: 2 unidades	05-04-2022 12.26	76.6			0.00		
D16	1901-06-C7: 12 unidades / 1901-06-C8: 12 unidades	10 / 9 (10) 10	2203-05-R24: 2 unidades	05-04-2022 12.26	76.6	76.70	77.15	-0.45	0.1	0.55
D17	1901-06-C7: 12 unidades / 1901-06-C8: 11 unidades	25 / 21	2203-05-R22: 2 unidades	05-04-2022 12.26	70.2	70.31	70.43	-0.12	0.11	0.23

0.16   2.91

	Design	Poka-Yoke	Non Poka-Yoke
Collar with nose except C08 & C12	733.8	737.48	740.35
Collar with nose except D07 & D11	734.2	734.51	736.02
Remove 2 collars in C08, D07, C12 & D11			
Collar w/nose (C04-C16)	861.4	737.48	740.35
Collar w/nose (D04-D14)	887.4	734.51	736.02
Total C-Collars (C01-C19)	1533.8	1210.25	1214.55
Total D-Collars (D01-D17)	1534.2	1104.56	1107.51

MCBXFB05

- **MCBXFB05, total difference to nominal length inside the pole window:**

  - Inner dipole:
    - Poka-yoke side, Collars A → - 1.96 mm
    - Non poka-yoke side, Collars A → - 2.53 mm

    - Poka-yoke side, Collars B → + 2.66 mm
    - Non poka-yoke side, Collars B → + 2.29 mm

  - Outer dipole:
    - Poka-yoke side, Collars C → + 4.05 mm
    - Non poka-yoke side, Collars C → + 8.35 mm

    - Poka-yoke side, Collars D → + 0.16 mm
    - Non poka-yoke side, Collars D → + 2.91 mm

    We will act on the OD collar sets C to try to get a more homogenous result. Main deviating sets are highlighted in yellow in previous slide.

Detailed status: Components and tooling

- <u>Rivets</u>

  - Very small stock at B.180:

Model	Qty.
R12	12
R18	32
R21	8
R22	21
R23	2
R24	63
R25	8
R26	2
R27	1

We need CIEMAT to send us rivets and rods for backup!

Detailed status: Components and tooling

- <u>Yoke laminations</u>

  - Available at B.180:
    - MCBXFB05 (not checked)

  - At CERN's storage:
    - MCBXFA1 (not checked)

  We will verify the status of the laminations as soon as possible following the recent e-mail exchange on oxidation issues!

Detailed status: Components and tooling

- **End plates:**

  - Available at B.180:
    - MCBXFB05 (not checked), we need to machine it.

  - At CERN's storage:
    - MCBXFA1 (not checked)

Other items

- Connection box:
  - Available for all MCBXFB magnets
  - Available for MCBXFA1 and MCBXFA2
  - Hardware (screws) for MCBXFB05, MCBXFA1 and MCBXFA2

- Yoking rods, nuts, etc:
  - Full set for B05 and B06: 1 rod "for MCBXFB05" being repaired.
  - No rods for MCBXFA (under production - they will come shortly, already asked for all MCBXFA magnets)
  - Hardware (nuts, etc.) for MCBXFB05, MCBXFB06, MCBXFA1 and MCBXFA2

- Collaring keys & rods:
  - Inner rods available for all MCBXFB magnets and MCBXFA1 and MCBXFA2
 - Outer keys available for all MCBXFB and MCBXFA magnets (not cut)

Other items

- Coil shimming:
  - G10 strips for inner shimming available for all MCBXFB and MCBXFA magnets
  - Inox strips for outer shimming available for all MCBXFA magnets
    - No Inox strips for MCBXFB

  - Stock of Kapton layers:
    - Number of magnets in stock to be defined after first assembly

| Kapton for shimming				
thickness	width	length (m)	N Spools	total (m)
50 um	10 mm	76	9	684
75 um	10 mm	48	38	1824
125 um	10 mm	32	62	1984
Kapton for leads insulation				
thickness	width	length (m)	N Spools	total (m)
50 um	11.16 mm	76	11	836

Other items

- We asked (already on-going) CIEMAT for:

  - A second unit of the GPI controller
  - Spare resistances (x5) for GPI molds
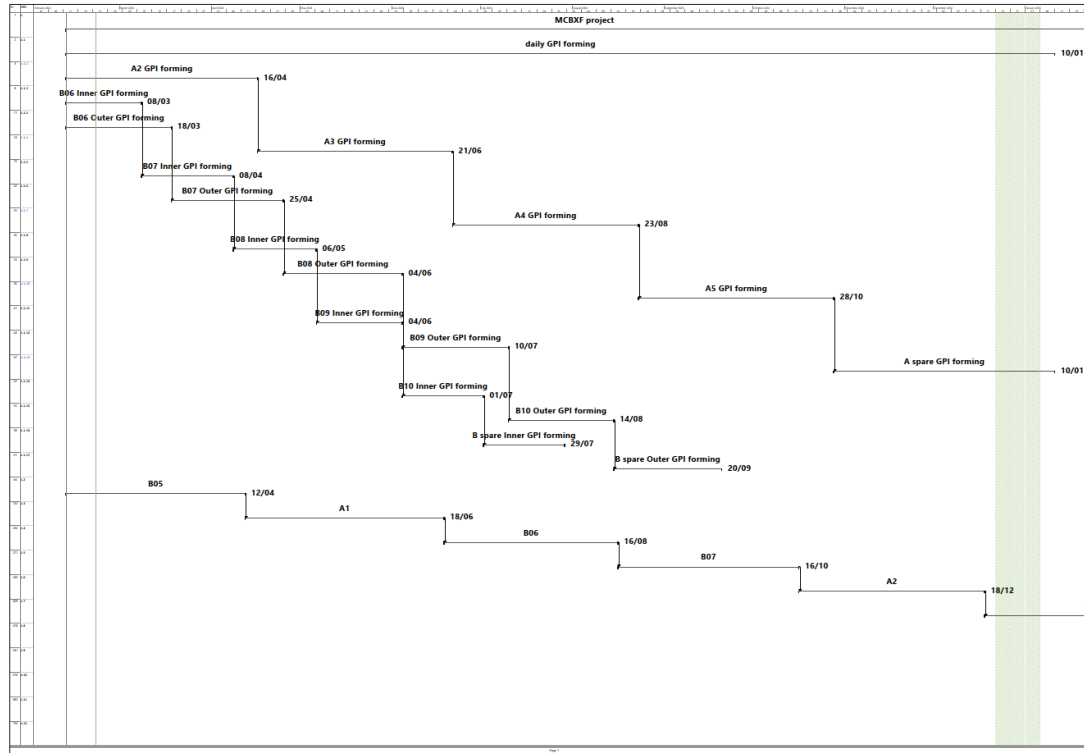 - A full set of MCBXFA rotating/assembly tooling with baseplate

Planning
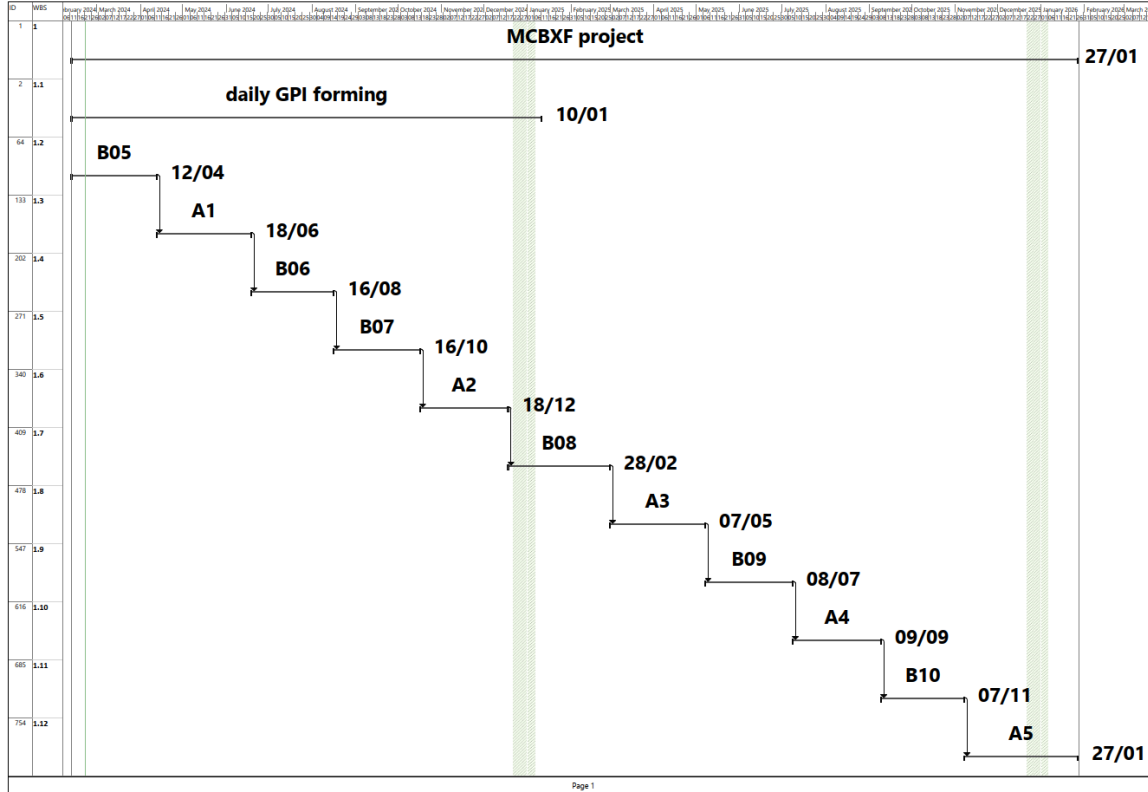
Planning (B05)
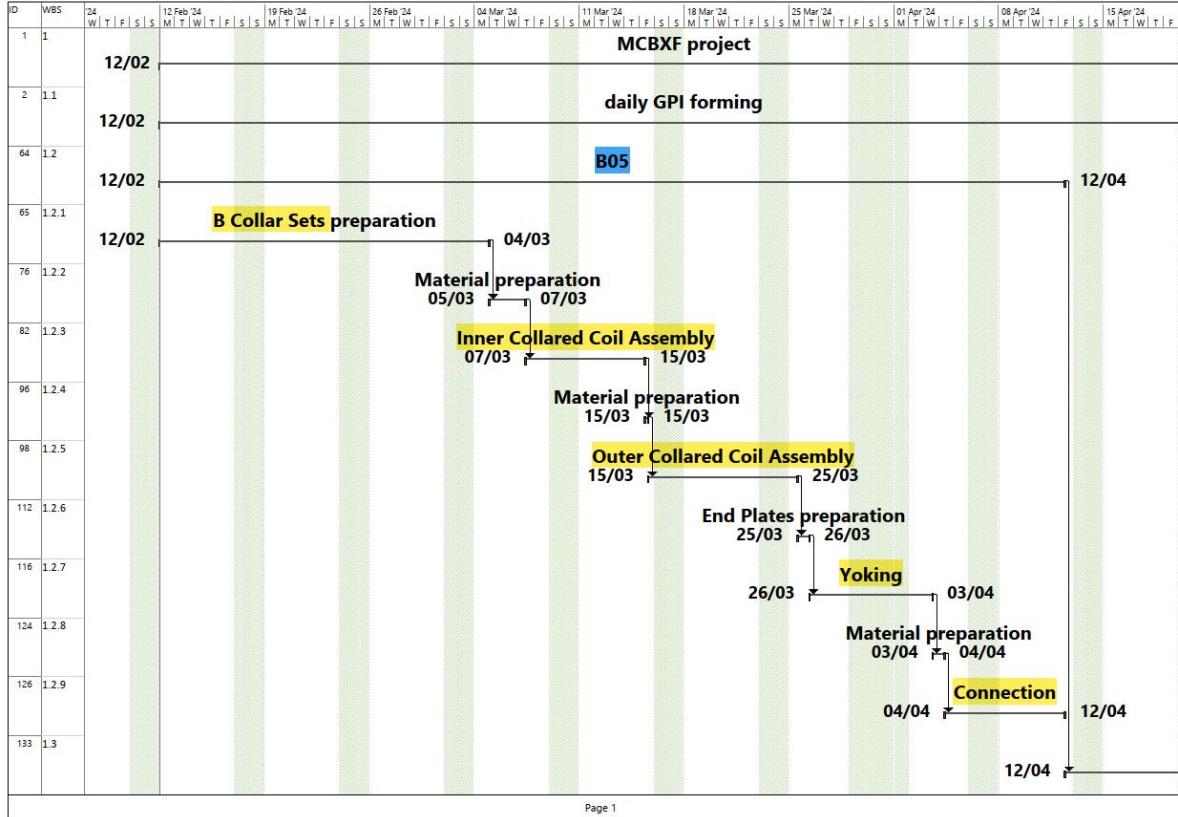
Planning (GPIs)

Summary / Action items

- Up to now, activities are following the established planning
    - If no unexpected issues, we are covered in terms of components to assemble MCBXFB05

  We can proceed with the finishing of Inner and Outer dipole collar sets for B05 (although we do not have all rivets in stock, we can cut from what we have).

- We need **as a priority** CIEMAT to send:
    - Unfolded GPIs
    - Rivets and spare rods
    - Collaring shoes
    - Inox strips
    - The requested items that are under production