

Commissioning Forces

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Request by J. Pasternak



Evaluate forces for following cases (J in A/mm²):

- Solenoid mode

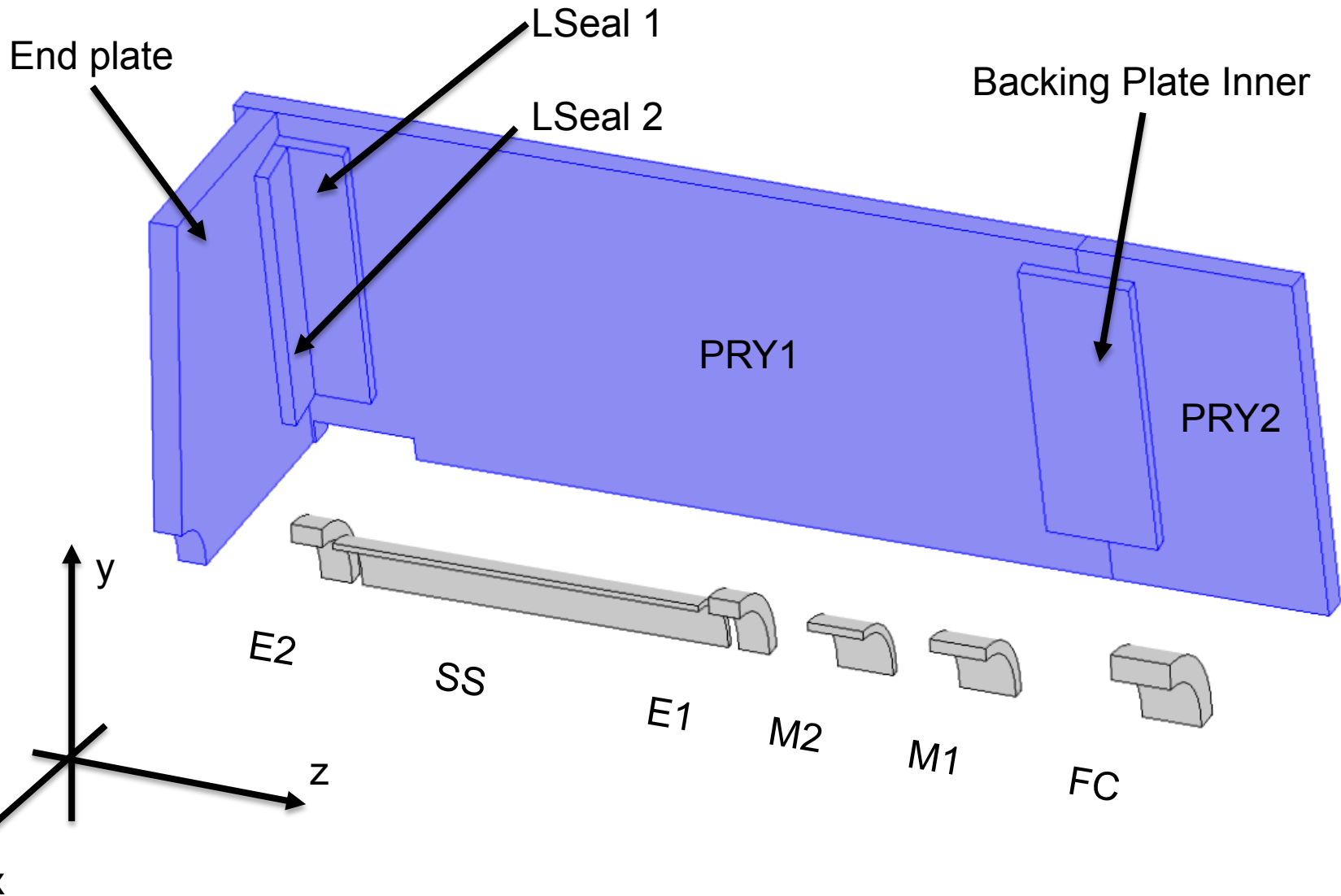
- E2: 134.36
- C: 144.90,
- E1: 124.46,
- M2: 132.56,
- M1: 146.48,
- FC: 67.15.

- Flip mode

- E2: 131.71
- C: 147.01,
- E1: 124.46,
- M2: 144.99,
- M1: 137.65,
- FC: 105.21.

- Non-linear magnetostatic simulation
- Forces evaluated using Maxwell Stress Tensor
- Forces in table are for exact geometry shown on next slide
 - Table values do **not** take into account symmetry
 - Example: coil forces in x,y direction will be zero; coil forces in z-direction need to be multiplied by 4
- All forces in N

Geometry



	Fx	Fy	Fz
PRY1	-45878	-9272.3	996.4
PRY2	-1488.2	-163.43	-853.25
EndPlate	-3424.8	-4516.7	70803
BackingPlateInner	9556.9	1902.4	173.08
BackingPlateOuter	-9487.1	-1929.6	0.53879
LSeal1	38248	7779.7	-21136
LSeal2	692.75	136.85	-15991
FC	7.78E+005	7.78E+005	-6.76E+005
M1	5.64E+005	5.64E+005	-50768
M2	3.77E+005	3.76E+005	-12002
E1	3.90E+005	3.89E+005	-2.12E+005
SS	2.25E+006	2.25E+006	-18723
E2	4.43E+005	4.43E+005	3.37E+005

Solenoid



	Fx	Fy	Fz
PRY1	-40475	-8229	2502.4
PRY2	-1085.9	-217.57	-2373.6
EndPlate	-3435.5	-4584	71890
BackingPlateInner	25042	5092.8	2.9132
BackingPlateOuter	-24881	-5062.6	0.31345
LSeal1	38886	7909.9	-21702
LSeal2	717.96	142.05	-16021
FC	6.49E+005	6.49E+005	1.69E+005
M1	6.53E+005	6.53E+005	-39471
M2	3.40E+005	3.40E+005	-2023.1
E1	3.90E+005	3.90E+005	-2.11E+005
SS	2.21E+006	2.21E+006	-24867
E2	4.57E+005	4.56E+005	3.39E+005

Reference: 240 MeV Flip



	Fx	Fy	Fz
PRY1	-45788	-9259.6	916.51
PRY2	-1680.7	-194.21	-874.01
EndPlate	-3663.6	-4524.4	70307
BackingPlateInner	9787.8	1951	174.69
BackingPlateOuter	-9731.1	-1979.2	0.45705
LSeal1	38237	7778.8	-21089
LSeal2	578.35	105.85	-16790
FC	1.03E+006	1.03E+006	-7.83E+005
M1	5.56E+005	5.53E+005	-46296
M2	3.67E+005	3.66E+005	-12300
E1	3.80E+005	3.81E+005	-2.03E+005
SS	2.24E+006	2.24E+006	-17540
E2	4.42E+005	4.42E+005	3.35E+005

Reference: 240 MeV Sol



	Fx	Fy	Fz
PRY1	-41114	-8360.8	2056.4
PRY2	-239.24	-46.68	-2032.2
EndPlate	-3618.1	-4522.6	70962
BackingPlateInner	22068	4489.7	0.69116
BackingPlateOuter	-22020	-4480.2	0.13901
LSeal1	38809	7895.2	-21571
LSeal2	597.74	109.61	-16822
FC	5.52E+005	5.52E+005	1.30E+005
M1	5.68E+005	5.65E+005	-45019
M2	3.09E+005	3.08E+005	-8783.9
E1	3.78E+005	3.79E+005	-2.10E+005
SS	2.24E+006	2.24E+006	-19468
E2	4.42E+005	4.42E+005	3.35E+005