

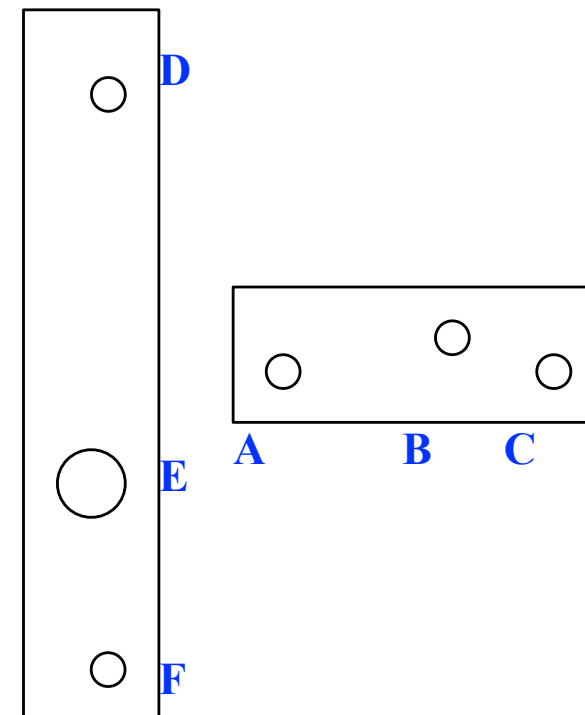
Flow diagrams for the HEPI actuators in Bleed and Operate Mode

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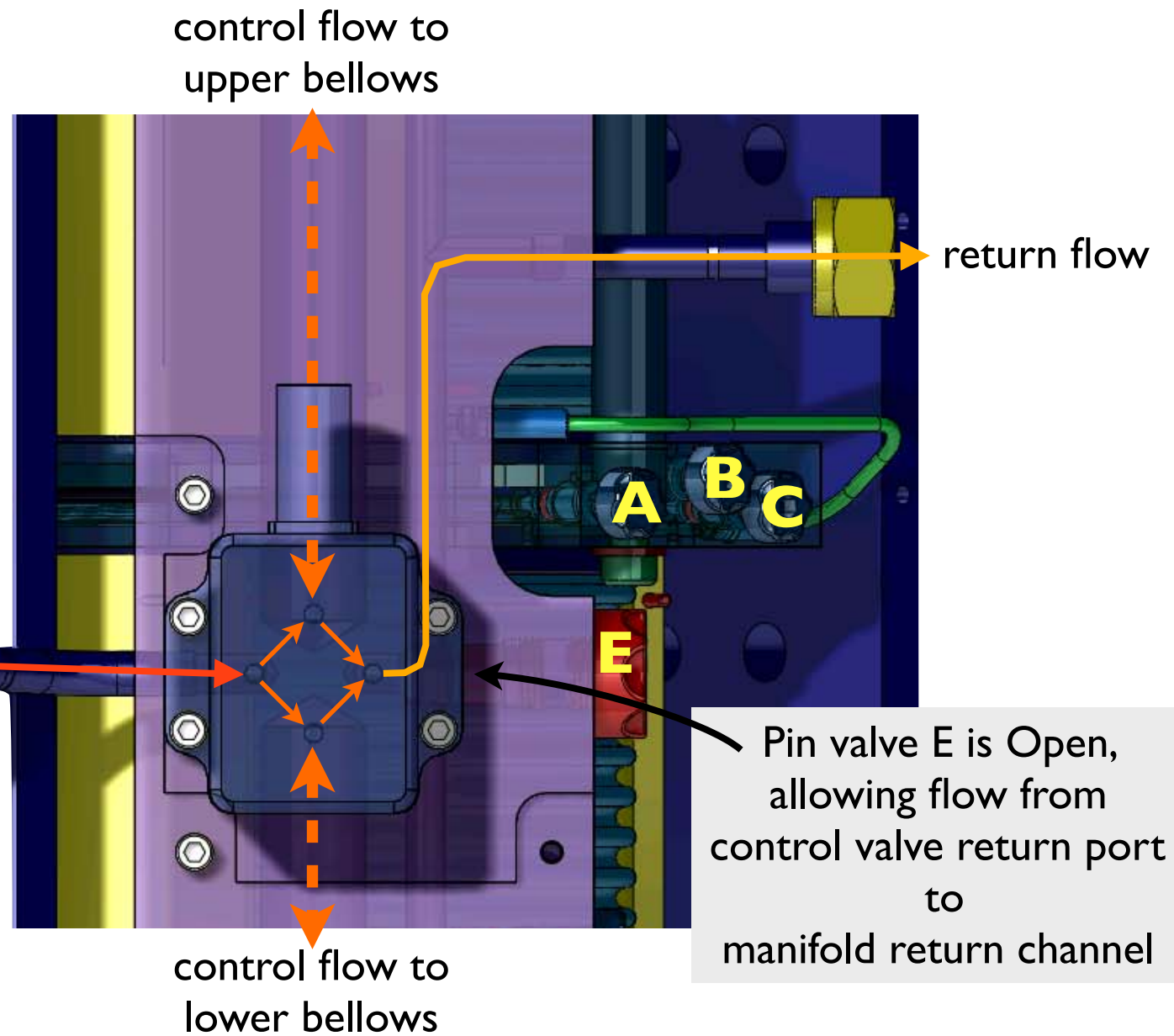
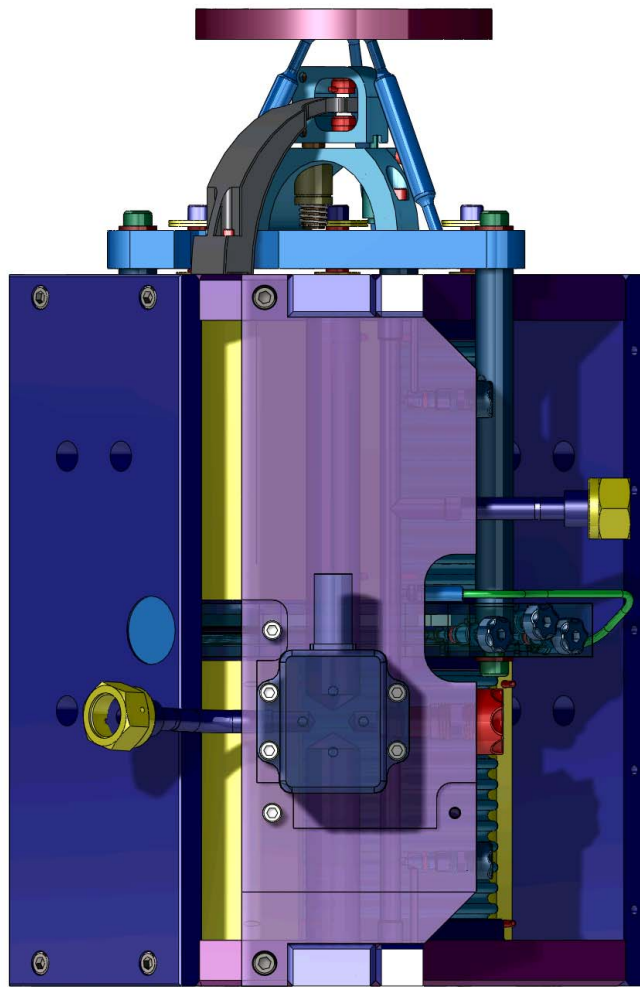
This is a set of sketches to show the flow of fluid through the HEPI actuators. The solid model views are based on solid models from D020284. The pin valve enumeration and the chart for which valves are open and closed is from the actuator bleed procedure in E040011-A-E.

	Vertical Actuator		Horizontal Actuator	
	Bleed	Operate	Bleed	Operate
A	○	X	○	X
B	X	X	○	X
C	○	X	○	X
D	○	X	○	X
E	X	○	X	○
F	X	X	○	X

○ = open, X = closed



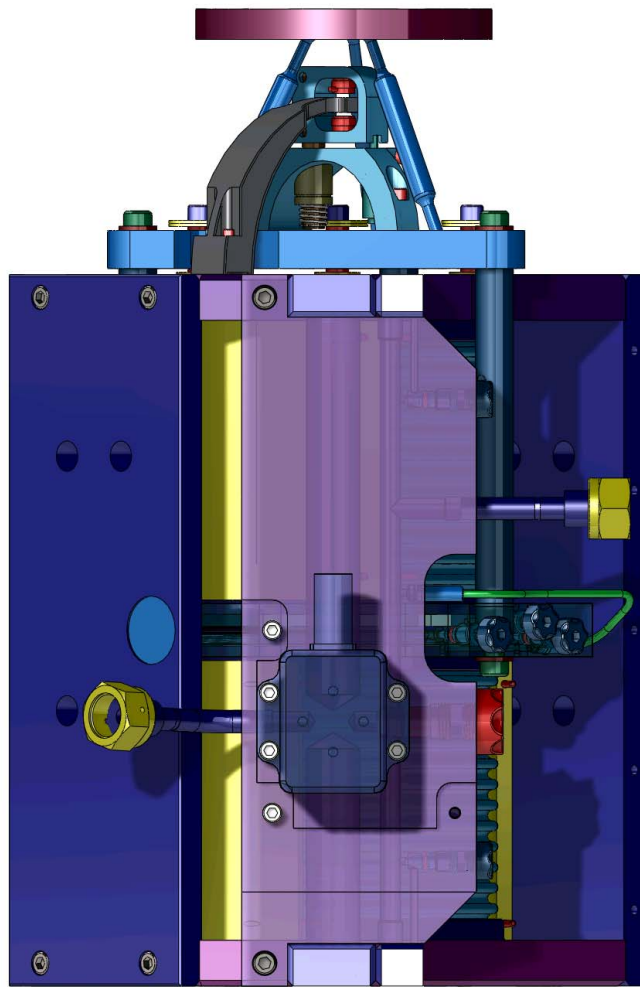
Operate Mode Horizontal and Vertical Actuators



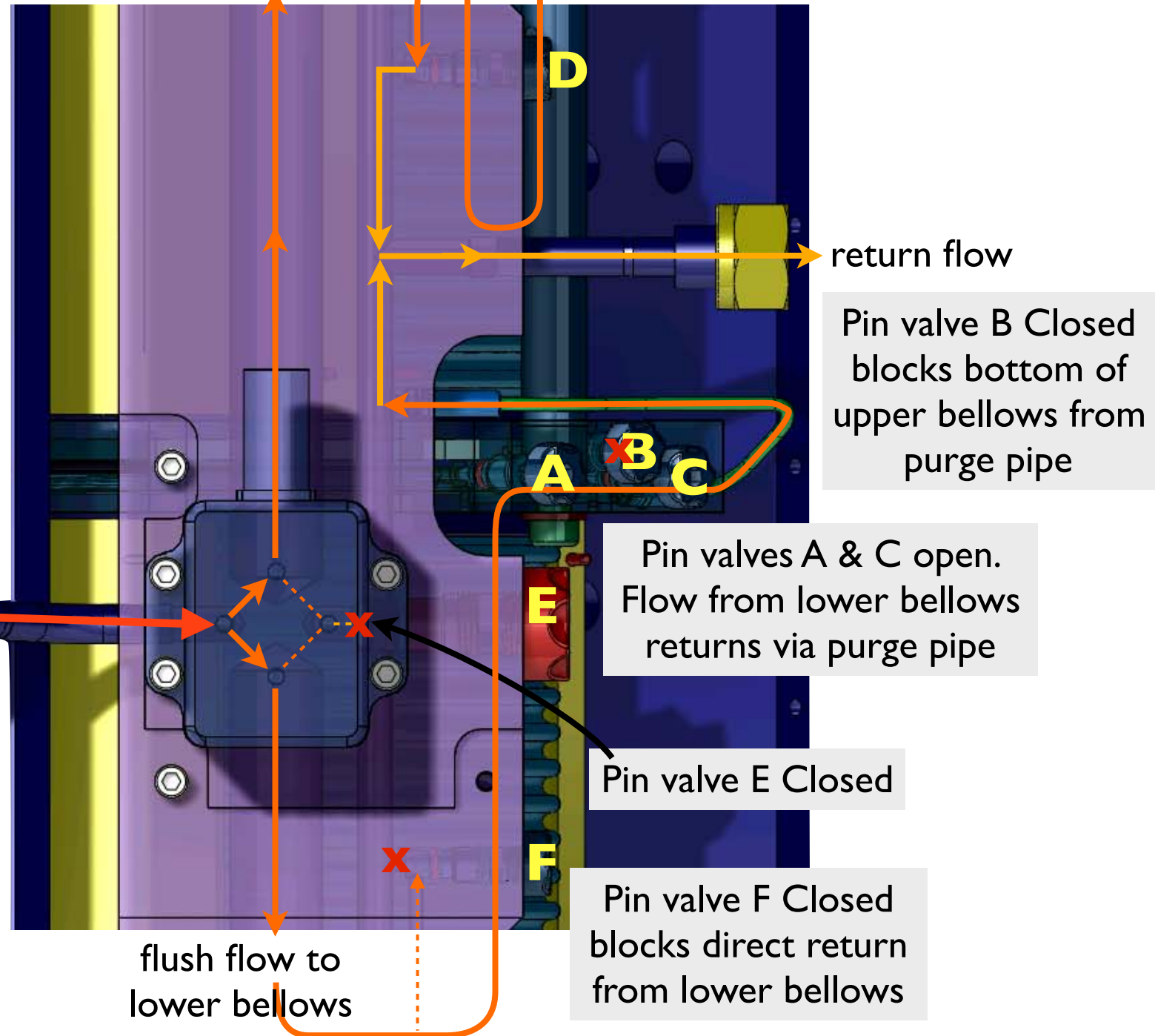
	Vertical Actuator		Horizontal Actuator	
	Bleed	Operate	Bleed	Operate
A	○	X	○	X
B	X	X	○	X
C	○	X	○	X
D	○	X	○	X
E	X	○	X	○
F	X	X	○	X

○ = open, X = closed

Bleed Mode - Vertical Actuator



flush flow to upper bellows gravity fills upper bellows. Flow returns via pin valve D

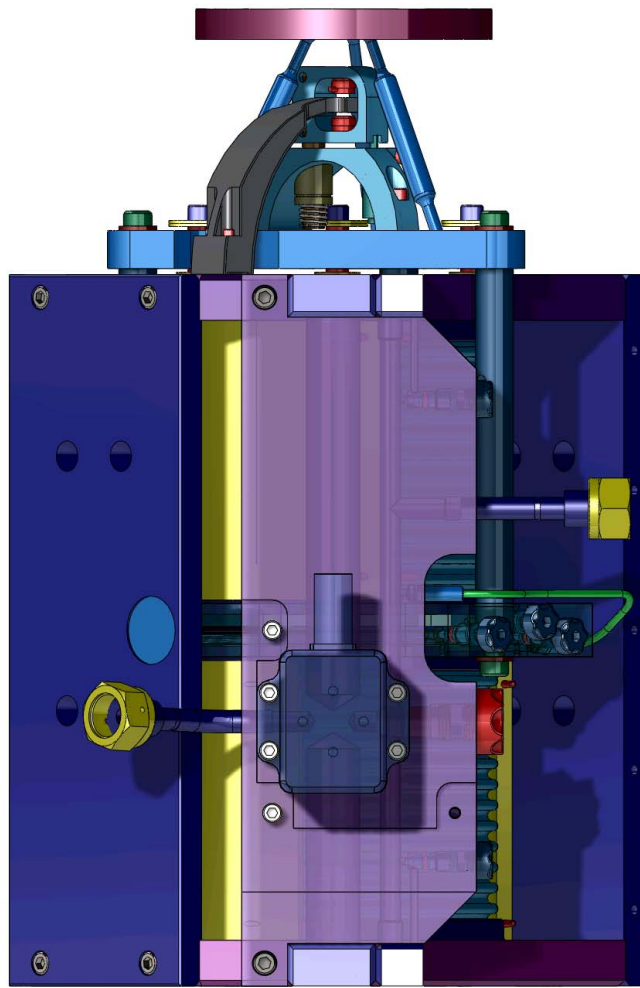


supply flow to control valve

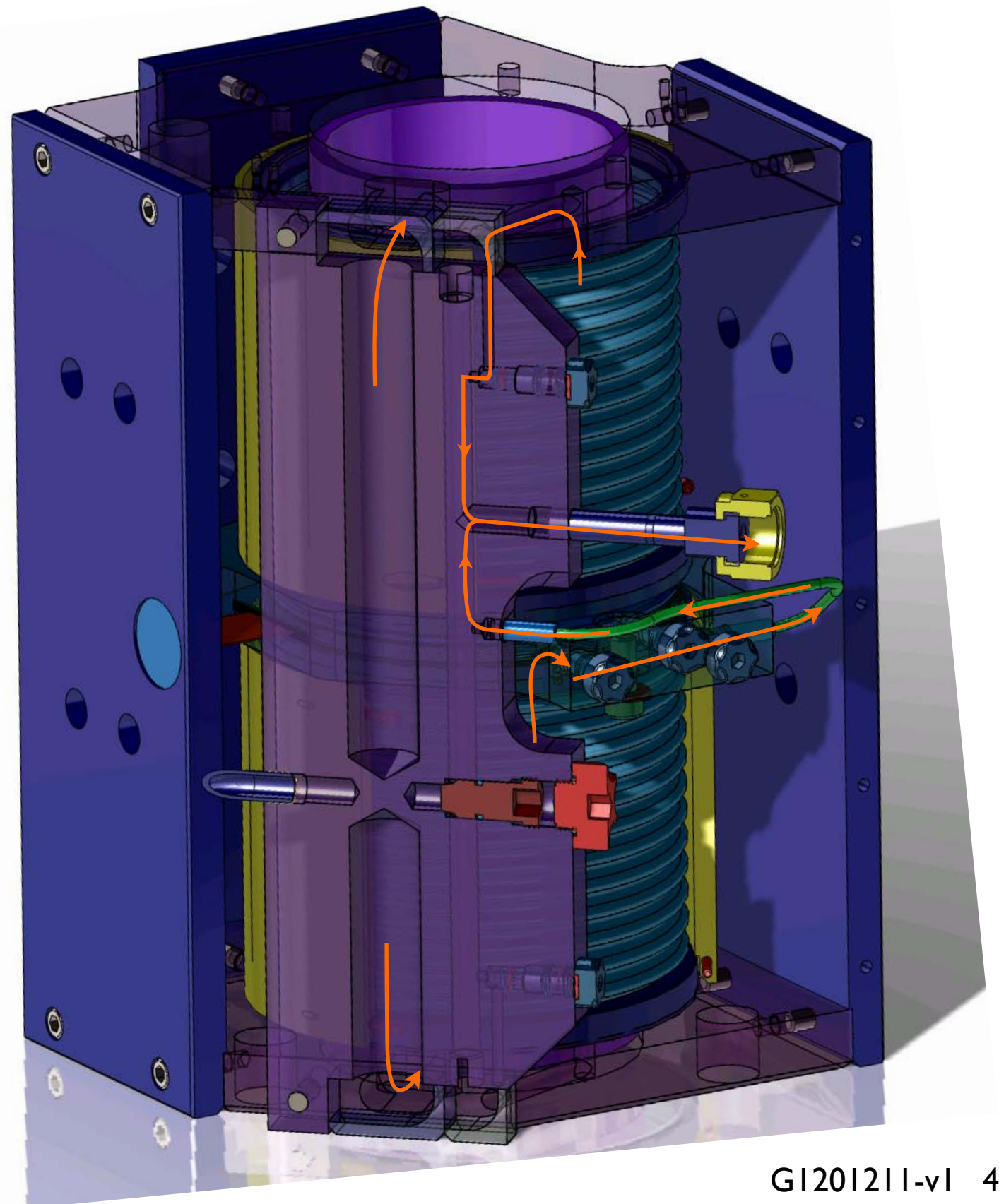
	Vertical Actuator		Horizontal Actuator	
	Bleed	Operate	Bleed	Operate
A	○	X	○	X
B	X	X	○	X
C	○	X	○	X
D	○	X	○	X
E	X	○	X	○
F	X	X	○	X

○ = open, X = closed

Bleed Mode - Vertical Actuator



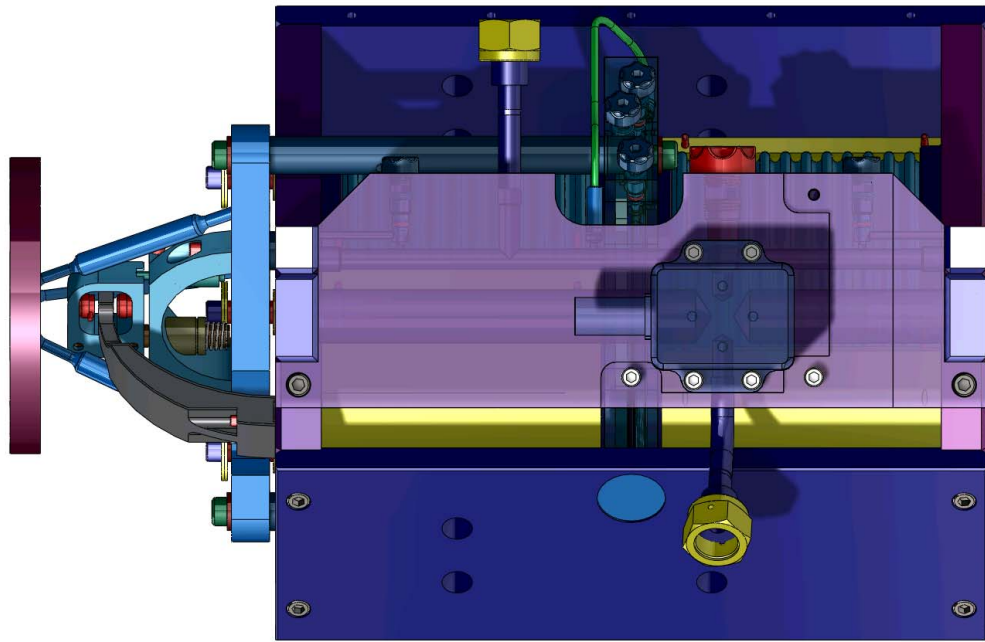
Cutaway of the Vertical Actuator.
 Air from the upper bellow is entrained by the return flow and brought back down to the return port. Air from the lower bellow comes out through pin valves A & C and is returned via the bleed tube.



	Vertical Actuator		Horizontal Actuator	
	Bleed	Operate	Bleed	Operate
A	○	X	○	X
B	X	X	○	X
C	○	X	○	X
D	○	X	○	X
E	X	○	X	○
F	X	X	○	X

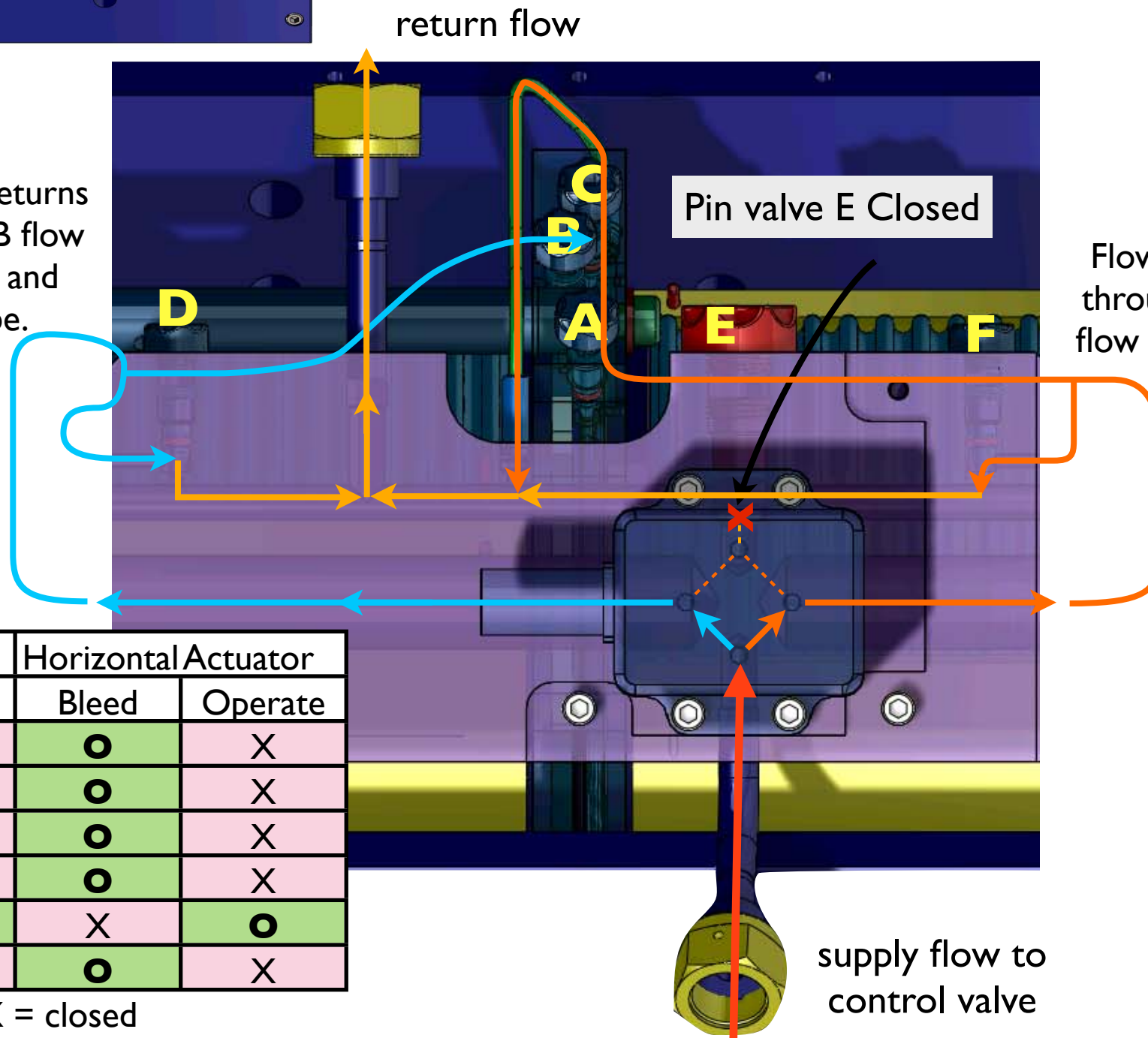
○ = open, X = closed

Bleed Mode - Horizontal Actuator



Note: The horizontal actuator is nominally set so the pin valve covers A, B, and C are on the top of the actuator.

Flow to tripod-side bellow returns through valves D & B. Valve B flow combines with A & C flow and returns via the bleed tube.



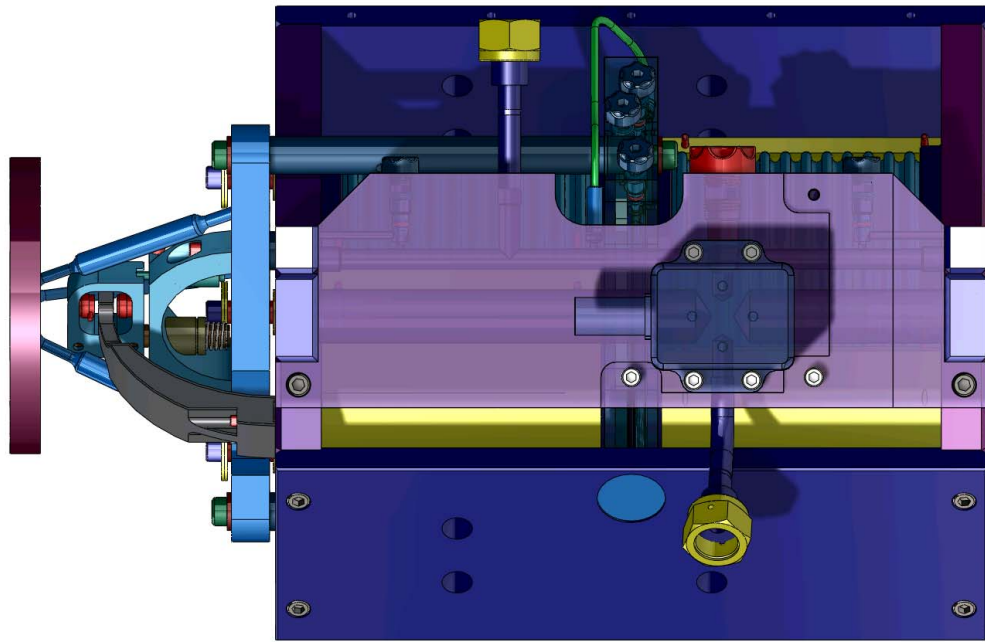
Flow to lower bellow returns through valves A, C & F. A & C flow returns via the bleed tube.

	Vertical Actuator		Horizontal Actuator	
	Bleed	Operate	Bleed	Operate
A	○	X	○	X
B	X	X	○	X
C	○	X	○	X
D	○	X	○	X
E	X	○	X	○
F	X	X	○	X

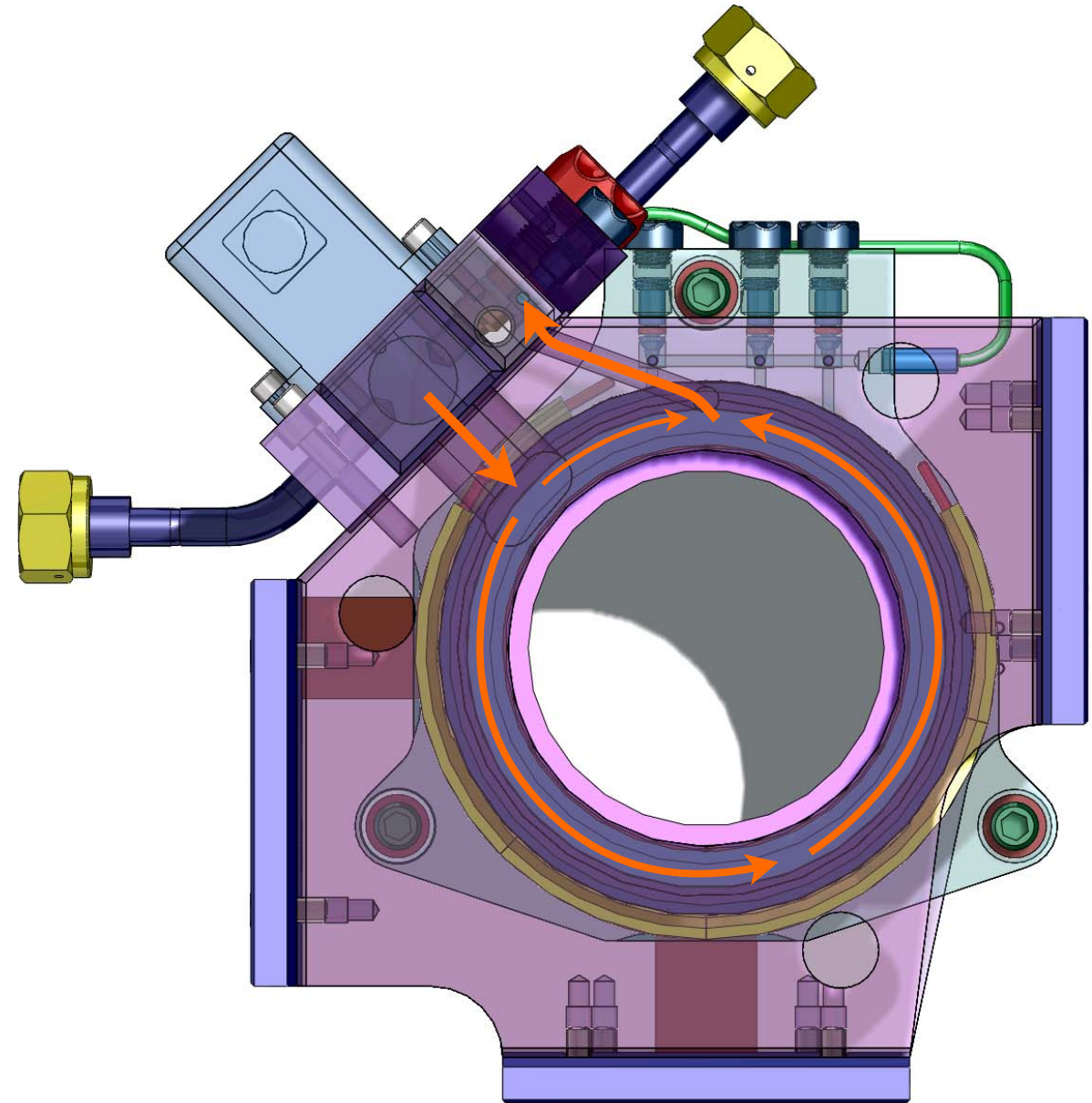
○ = open, X = closed

supply flow to control valve

Bleed Mode - Horizontal Actuator



End View of the horizontal actuator in bleed mode. The return channels for the actuator plate and for both end plates are at the top, to aid the air removal. Bubbles will still get trapped in the tops of the bellow convolutions. Tipping the actuator back and forth will help remove them.



	Vertical Actuator		Horizontal Actuator	
	Bleed	Operate	Bleed	Operate
A	○	X	○	X
B	X	X	○	X
C	○	X	○	X
D	○	X	○	X
E	X	○	X	○
F	X	X	○	X

○ = open, X = closed