
	CPC ENGINEERING SPECIFICATION	
	SECTION SOP	Doc. No. CES-26-103
	ISSUE "A"	REV "0"
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### FLUSHING AND CLEANING OF HYDRAULIC SYSTEMS

Rev	Reason of Change	Date	Made By	Reviewed By	Approved By	Status
0	INITIAL RELEASE	01-02-2024	PK	USR	JG	Released



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## Flushing Procedure for BOP Control Unit

### Standard References:

- API 16D – Specification for Control Systems for Drilling Well Control Equipment

### 1. Objective

To ensure the Blowout Preventer (BOP) control unit is properly flushed to remove manufacturing debris, assembly contamination, or degradation byproducts, ensuring operational reliability and conformance to cleanliness requirements.

### 2. Scope

Applicable to new, repaired, or overhauled BOP control units (surface or subsea), including the reservoir, manifold, piping, and associated actuators prior to commissioning.

### 3. Equipment and Materials

- High GPM triplex pump module (On existing unit) or External flushing unit (pump, filters, hoses)
- High-efficiency filter elements (20 micron or better)
- Clean flushing fluid (same grade as final hydraulic fluid)
- Pressure gauges
- Lint-free cloths and visual inspection tools (white wipes)
- Clean, dry compressed air for drying

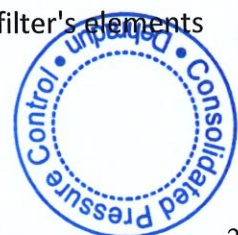
### 4. Safety Precautions


- Ensure the system is de-energized and depressurized.
- Use appropriate PPE: gloves, goggles, flame-retardant clothing.
- Confirm area is well-ventilated during flushing and drying.
- Tag and lock out power sources and pressure lines.

### 5. Flushing Procedure

#### 5.1 Pre-Flushing Preparation

- Verify all components (reservoir, manifold, piping, accumulators) are installed and accessible.
- Remove all inline filter's elements and replace with temporary flushing filter's elements



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## 5.2 Flushing Loop Setup

- Keep all manifold valves in centre position except one and make its loop by connecting its leg pipes
- Connect the electrical supply to the starter
- Configure return line back to reservoir or external flushing tank.

## 5.3 Flushing Operation (Lines and reservoir)

- Close all isolation valve of accumulator module
- Fill the oil in the reservoir to required level.
- Start the Triplex pump module and run the system for 30 mins for single loop
- Continue the above process to all manifold valve's outlets.

## 5.4 Filters and Elements

- Open and clean all elements of filter's elements
- Continue flushing until elements of filters are found clean
- If residual not found stop the above process

## 6. Cleaning of hydraulic lines and manifolds or outlets

- Open the outlets of leg pipes
- Connect the compressed air to the alternate hydraulic supply end.
- Put all the manifold valves in center position
- Now start each leg pipe cleaning one by one by keeping the valve in open and close position for at least 5 mins each
- Put all the valves in center position
- Open the bleeder valve and allow the air flushing through manifold into the reservoir for 15 mins
- Stop the air supply

## 7. Cleaning of the reservoir

- Take out the oil and put it in drum for disposal
- Open the manway both side and use the compressed air to clean
- Use the clean cloth with extension to clean the reservoir

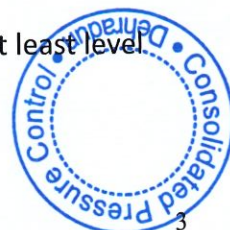
## 8. Cleanliness Acceptance criteria for reservoir


Verification:

- Conduct white wipe test for visible debris (no residual acceptable).

## 9. Post-Flushing Actions

- Change the elements of filters
- Refill reservoir with new hydraulic fluid or should have cleanliness level of at least level NACE # 10
- Document filter change-outs or particle count readings.



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## 10. Documentation Requirements

Include the following in the flushing report:

- Flushing start/end dates and times
- Equipment used (pump specs, filter ratings)
- Number of filter changes
- Total flushing fluid circulated
- Visual inspection results
- Sign-off by responsible engineer or technician

