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Remove Grease Caps to Check for Leaks

ROV footage captured a lower outer choke fail-safe valve venting hydrostatic pressure from the stem grease fitting. It was theorized that the grease fitting cap had not been properly tightened when the BOP was on the surface, and was bypassing fluid from a faulty check valve. When fully tightened, the cap of these grease fittings seals against the grease fitting body, providing a secondary seal in conjunction with the primary ball and spring check valve seal within the fitting.

In order to ensure that the primary spring and ball check valve in the grease fitting is functional before running the BOP, the grease fitting cap should be loosened or removed during pressure testing. This keeps the cap from sealing against the outer gland, and will allow fluid to vent through the bypass ports should the primary check valve leak. WEST recommends fully removing the cap. This serves as a visual reminder to reinstall the cap when testing has concluded. If the cap is only loosened, it may appear to be tightened and could be run subsea without the benefit of secondary sealing. After testing, the cap should be reinstated on the fitting and torqued to the manufacturer's specification (typically 50 ft-lbs) to guarantee that the secondary seal is reestablished.

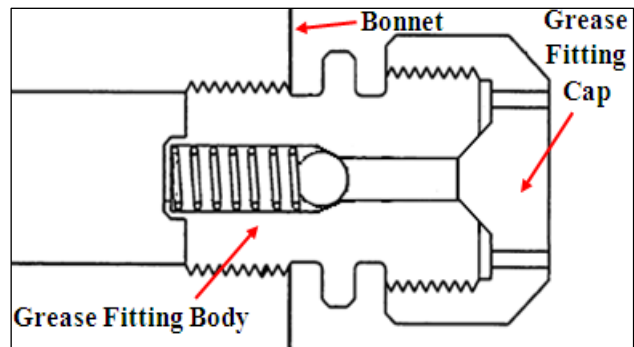


Figure 1 - simplified view of high pressure grease fitting with a grease fitting cap

Description of Issue

A typical fail-safe valve grease fitting contains an internal ball and spring check valve that functions as a primary seal (figure 1). The design of the cap includes a cone that seals against the fitting body, providing a secondary seal. If both of these seals fail or if the cap is not tightened properly, pressure will vent out from bypass ports on the cap (figure 2).

For more information or technical questions, please contact WEST Engineering Services at west@westengineer.com, call 281-375-5515, or visit our website at www.westengineer.com.

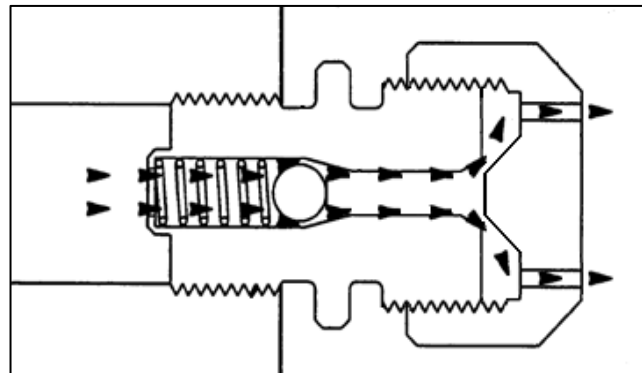


Figure 2 - grease fitting shown bypassing pressure through both primary and secondary seals.