ABSTRACT

The present inventions contemplate an improved well tool actuator and method that does not require more expensive downhole equipment and can be utilized with limited actuation pressures.

According to the improved well tool actuator and method of the present inventions, a fluid pressure intensifier is placed in the well and coupled to the downhole device to be manipulated. By using a fluid pressure intensifier the actuation pressure can be increased to a pressure sufficient to operate or manipulate the downhole device without the necessity of increasing the tubing pressure. According to the present invention the actuation pressures supplied by the intensifier can exceed the safe operating rated pressures of the well tubing and equipment. The well tool actuators of the present invention are self-contained in that they are powered from the tubing fluid pressure itself without a high-pressure hydraulic or electrical connection to the surface.

According to the present inventions, subterranean hydraulically actuated well tools can be actuated at higher pressures than the supplied pressure. Fluid pressure intensifiers circuits can be assembled in and carried downhole with the actuation tool and removed once the actuation process is complete. Also, fluid pressure intensifier circuits can be assembled as a part of the well tool and operated remotely.

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