

HYBRID SEAL

Abstract

A casing hanger seal assembly (27) is lowered into a pocket (19) between a casing hanger (15) and a wellhead housing (11) while in a run-in position. The seal assembly (27) has a metal-to-metal upper seal ring (29) and an elastomeric and metal lower seal ring (31) carried by and below the upper seal ring. The upper and lower seal rings (29, 31) are movable from a run-in position to a set position sealing between the sidewalls (17, 13) of the casing hanger (15) and the wellhead housing (11) by applying a downward force. The downward force required to move the lower seal ring (31) to the set position is less than the downward force required to move the upper seal ring (29) to the set position. A downward force applied to the upper seal ring (29) after the lower seal ring (31) has landed in the pocket (19) transfers to the lower seal ring (31) to cause the lower seal ring to move to the set position before the upper seal ring (29) moves to the set position.

Figure 1