CLAIMS

1. A wellhead system comprising:

a first position casing hanger, arranged within a wellbore, the first position casing hanger supported, at least in part, by a load member;

a second position casing hanger, arranged within the wellbore, the second position casing hanger positioned axially higher and stacked on the first position casing hanger, a weight of the second position casing hanger supported, at least in part and less than entirely, by the first position casing hanger and, at least in part, by an actuated load shoulder absent contact between the first position casing hanger and the second position casing hanger, the actuated load shoulder transferring a force into a high pressure housing, the actuated load shoulder comprising a load ring having a hanger side profile and a housing side profile, the load ring adapted to engage a hanger profile formed in the second position casing hanger and a housing profile formed in the high pressure housing upon activation via the first position casing hanger, the load ring being driven toward the high pressure housing via a force applied to a contact surface arranged at a first angle, the force driving the load ring toward the hanger profile along a hanger groove arranged at a hanger groove angle, wherein the first angle is less than a housing groove angle of the housing profile.

2. The wellhead system of claim 1, further comprising:

a plunger coupled to the second position casing hanger in a retracted position and adapted to move relative to the second position casing hanger in an activated position, the plunger arranged between the load ring and the first position casing hanger to transmit the force to the load ring.

3. The wellhead system of claim 1, wherein the hanger side profile comprises a plurality of hanger side grooves, each groove of the hanger side profile including an upstream face and a downstream face, the upstream face positioned at a first hanger side groove angle and the downstream face positioned at a second hanger side groove angle.

4. The wellhead system of claim 3, wherein the hanger profile comprises a plurality of hanger grooves, each groove of the hanger profile including a slanted portion arranged at the hanger groove angle, wherein each hanger groove angle is shallower than the housing groove angle.

5. The wellhead system of claim 1, wherein the housing side profile comprises a plurality of housing side grooves, each groove of the housing side profile grooves including an upper face and a lower face, the upper face positioned at a first housing side groove angle and the lower face positioned at a second housing side groove angle.

6. The wellhead system of claim 5, wherein the housing profile comprises a plurality of housing profile grooves, each groves of the housing profile grooves including an upper portion arranged at a first housing groove angle and a lower portion arranged at a second housing groove angle, the respective upper portions aligning with the respective upper faces when the housing side profile contacts the housing profile.

7. The wellhead system of claim 1, wherein the first angle, the hanger groove angle, and the housing groove angle are particularly selected to overcome an inward radial reaction force produced by the housing, the first angle being downwardly sloped toward the high pressure housing.

8. The wellhead system of claim 1, wherein the load ring moves radially outward from a retracted position where the load ring is not in contact with the housing to an activated position where the load ring is in contact with the housing.

9. The wellhead system of claim 1, wherein the load ring is segmented, the second position hanger including a plurality of load ring segments.

10. A wellhead system, comprising:

a housing positioned within a wellbore, the housing including a housing profile formed, at least in part, by a plurality of housing profile grooves;

a first position casing hanger, arranged within a wellbore, the first position casing hanger supported, at least in part, by a load member;

a second position casing hanger, arranged within the wellbore, the second position casing hanger positioned axially higher and stacked on the first position casing hanger, the second position casing hanger including a hanger profile formed, at least in part, by a plurality of hanger profile grooves;

a load ring adapted to move radially outward from the second position casing hanger, the load ring comprising:

a hanger side profile having a plurality of hanger side profile grooves, at least a portion of the hanger side profile grooves aligning with at least a portion of the hanger profile grooves;

a housing side profile having a plurality of housing side profile grooves, at least a portion of the housing side profile grooves aligning with at least a portion of the housing profile grooves when the load ring is in an activated position; and

a contact surface positioned at a lower region of the load ring, the contact surface arranged at a contact surface angle, the contact surface angle adapted to receive a reaction force based least in part, on downward movement of the second position casing hanger, relative to the first position casing hanger;

wherein at least a portion, but less than an entirety, of a weight of the second profile casing hanger is supported by the housing when the load ring is in the activated position, the load ring being moved into the activated position via engagement between the first position casing hanger and the second position casing hanger, absent contact between the first position casing hanger and the second position casing hanger, the contact surface receiving the reaction force and driving movement of the load ring in an axial direction toward the hanger grooves arranged at respective hanger groove angles and radially toward the housing profile, the housing profile grooves arranged at respective housing groove angles greater than the contact surface angle.

11. The wellhead system of claim 10, wherein each groove of the hanger side profile grooves includes an upstream face at a first angle and each groove of the housing side profile

grooves includes an upper face at a second angle, the first angle being different from the second angle.

12. The wellhead system of claim 11, wherein at least one of the first angle or the second angle is selected to increase a proportion of the weight of the second profile casing hanger transmitted to the housing.

13. The wellhead system of claim 10, wherein the load ring moves radially outward and axially upward, relative to the second position casing hanger, in the activated position.

14. The wellhead system of claim 10, further comprising:

a plunger coupled to the second position casing hanger in a retracted position and adapted to move relative to the second position casing hanger in an activated position, the plunger arranged between the load ring and the first position casing hanger to transmit the reaction force to the load ring via the contact surface.

15. The wellhead system claim 14, wherein the contact surface angle, the hanger groove angle, and the housing groove angle are particularly selected to overcome an inward radial reaction force produced by the housing, the contact surface angle being downwardly sloped away from the second position casing hanger.

16. The wellhead system of claim 14, wherein the plunger is secured to the second position casing hanger via a shear pin, the shear pin breaking to facilitate movement between the plunger and the second position casing hanger when acted on by a force exceeding a threshold.

17. A method for arranging a stacked hanger configuration, comprising:

providing a second position casing hanger having an actuated load shoulder, the actuated load shoulder including a load ring that moves between a retracted position and an activated position;

positioning the second position casing hanger, within a wellbore, proximate a housing profile formed in a high pressure housing, the second position casing hanger being axially uphole from a first position casing hanger;

engaging a shoulder of the first position casing hanger, via the second position casing hanger, absent contact between the first position casing hanger and the second position casing hanger, to drive the load ring radially outward from the second position casing hanger, the load ring receiving a driving force along an angled contact surface; and

engaging the housing profile, via the load ring, when the load ring is in the activated position.

18. The method of claim 17, further comprising:

applying an upward force to the second position casing hanger, the upward force moving the load ring to the retracted position; and

removing the second position casing hanger from the wellbore.

19. The method of claim 17, wherein the housing does not include a load shoulder to move the load ring to the activated position.

20. The method of claim 17, further comprising:

supporting at least a portion of a weight of the second position casing hanger via the first position casing hanger; and

supporting at least a portion of the weight of the second position casing hanger via the housing.