CLAIMS:

1. A wellhead system (20), comprising:

a first wellhead assembly (22); and

a second wellhead assembly (24), comprising:

a load member (28) adapted to be actuated to engage the first wellhead assembly (22) to enable the first wellhead assembly (22) to support the second wellhead assembly (24); and

a resilient actuation member (36) adapted to actuate the load member (28) at a desired position relative to the first wellhead assembly (22).

2. The wellhead system (20) as recited in claim 1, wherein the resilient actuation member (36) is adapted to engage a portion (38) of the first wellhead assembly (22).

3. The wellhead system (20) as recited in claim 2, wherein the actuation member (36) comprises a first engagement portion (48) and the second wellhead assembly (24) comprises a second engagement portion (52), the first and second engagement portions (48, 52) being adapted to cooperate to restrict axial movement of a main body (40) of the second wellhead assembly (24) in a first direction relative to the actuation member (36).

4. The wellhead system (20) as recited in claim 3, wherein the resilient actuation member (36) is adapted to block movement of the load member (28) in the first direction after the resilient actuation member (36) engages the portion of the first wellhead assembly (22).

5. The wellhead system (20) as recited in claim 4, wherein the resilient actuation member (36) is configured to elastically deform to enable axial movement of the main body (40) of the second wellhead assembly (24) in the first direction relative to the actuation member (36) when a sufficient force is applied to the actuation member (36).

6. The wellhead system (20) as recited in claim 4, wherein the second wellhead assembly (24) is adapted to drive the load member (28) outward when the main body (40) is moved in the first direction and movement of the load member (28) in the first direction is blocked by the actuation member (36).

7. The wellhead system (20) as recited in claim 6, wherein the first engagement portion (48) and the second engagement portion (52) are adapted to cooperate to urge the resilient actuation member (36) in a second direction opposite the first direction when a force is applied to the main body (40) of the second wellhead assembly (24) in the second direction after the load member (28) has been actuated by the actuation member (36).

8. The wellhead system (20) as recited in claim 7, wherein the second wellhead assembly (24) is adapted to urge the load member (28) outward when the resilient actuation member (36) is urged to move in the second direction opposite the first direction after the load member (28) has been actuated by the resilient actuation member (36).

9. The wellhead system (20) as recited in claim 8, wherein the first engagement portion (48) and the second engagement portion (52) are configured so that the first engagement portion (48) elastically deforms when the force applied to the main body (40) of the second wellhead assembly (24) in the second direction exceeds a desired magnitude to enable axial movement of the main body (40) in the second direction relative to the resilient actuation member (36).

10. The wellhead system (20) as recited in claim 9, wherein the load member (28) is resilient.

**WHAT IS CLAIMED IS:**

1. A wellhead system, comprising:

a first wellhead assembly having a bore with an axis and an internal profile and a tag shoulder in the bore;

a second wellhead assembly that is lowered into and landed within the bore of the first wellhead assembly, comprising:

a load member carried by the second wellhead assembly, the load member being actuable to engage the profile in the first wellhead assembly to enable the first wellhead assembly to support the second wellhead assembly;

an actuation member carried by the second wellhead assembly to move the load member into engagement with the profile, the actuation member having an outward extending actuation member shoulder landing on the tag shoulder, the actuation member having a downward extending leg and an inward-extending actuation member protrusion on the leg;

an outward extending second wellhead assembly protrusion on the second wellhead assembly, the actuation member having a run-in position wherein the second wellhead assembly protrusion is located on the actuation member protrusion, preventing downward movement of the second wellhead assembly relative to the actuation member after the actuation member has landed on the tag shoulder, until sufficient weight is applied to the second wellhead member to cause the leg to elastically deform, which moves the actuation member protrusion radially outward to allow the second wellhead assembly protrusion to slide past and below the actuation member protrusion; and

a retainer ring secured to the second wellhead assembly below the actuation member to retain the actuation member on the second wellhead assembly.

2. The wellhead system as recited in claim **1**, wherein the load member is resilient.

3. The wellhead system according to claim **1**, wherein:

the retainer ring has an upward extending annular portion that extends around the leg of the actuation member.

4. The wellhead system according to claim **1**, wherein:

the retainer ring has an upward facing shoulder located below a lower end of the leg;

a cylindrical upper portion extends upward from the upward facing shoulder, defining an annular cavity between the cylindrical upper portion and an outer surface of the second wellhead assembly; and

the leg is located within the cavity both during the run-in position and during a set position.

5. The wellhead system according to claim **4**, wherein:

the upper cylindrical portion has a greater radial thickness than the leg, defining a downward facing shoulder in a plane perpendicular to the axis; and

during the run-in position, the upward facing shoulder of the retainer ring is more closely spaced to the downward facing shoulder of the actuation member than during the set position.

6. The wellhead system according to claim **5**, further comprising:

a recess that is curved when viewed in cross section formed in the downward facing shoulder, the recess joining an outer surface of the leg with the downward facing shoulder of the actuation member.

7. The wellhead system according to claim **5**, further comprising an upward facing lip on an outer surface of the leg above a lower end of the leg.

8. A well system, comprising:

a housing assembly;

a hanger assembly,

wherein the housing assembly and the hanger assembly are adapted to cooperate to enable the housing assembly to support the hanger assembly,

the hanger assembly comprising:

a load member adapted to be extended from the hanger assembly to the housing assembly to enable the housing assembly to support the hanger assembly;

an actuation member adapted to actuate outward movement of the load member at a desired position within the housing assembly as the hanger assembly is lowered into the housing assembly and to urge the load member outward after the load member has been extended and a downward force is applied to the hanger assembly;

a retainer ring secured to the hanger assembly, the retainer ring having an upper cylindrical portion with an inner diameter greater than an outer surface portion of the hanger assembly, defining an annular cavity between the outer surface portion of the hanger assembly and the upper cylindrical portion; and

wherein a lower portion of the actuation member extends into the cavity.

9. The well system as recited in claim **8**, wherein the lower portion of the actuation member is resilient.

10. The well system as recited in claim **8**, wherein the housing assembly and the actuation member are adapted to enable the housing assembly to block downward movement of the actuation member as the hanger assembly is lowered into the housing assembly.

11. The well system as recited in claim **10**, wherein the actuation member is adapted to block downward movement of the load member after the housing assembly blocks downward movement of the actuation member.

12. The well system as recited in claim **11**, wherein the lower portion of the actuation member comprises:

a first engagement portion;

the hanger assembly comprises a second engagement portion disposed on a hollow body;

the first and second engagement portions being adapted to cooperate to restrict downward movement of the hollow body relative to the actuation member after downward movement of the actuation member is blocked by the housing assembly.

13. The well system as recited in claim **12**, wherein the lower portion of the actuation member is adapted to elastically deform to enable downward movement of the hanger assembly relative to the actuation member when the actuation member is engaged by the housing assembly and the hollow body of the hanger assembly provides a sufficient downward force to the actuation member.

14. The wellhead system as recited in claim **13**, wherein the first engagement portion and the second engagement portion are adapted to cooperate to urge the actuation member upward when an upward force is applied to the hanger assembly after the load member has been actuated.

15. The wellhead system according to claim **8**, wherein the retainer ring prevents substantially all axial movement of the actuator member relative to the hanger assembly while the actuator member is in a run-in position.

16. The wellhead system according to claim **15**, wherein the hanger assembly moves axially relative to the actuator member when moving from the run-in position to a set position.

17. The wellhead system according to claim **16**, wherein the lower portion of the actuator member is located within the cavity during the run-in position and the set position.

18. A well system, comprising:

a hanger assembly adapted to be lowered into a housing, comprising:

a body having an axis and a body rib protruding radially outward from an outer surface portion of the body;

a load member carried by the body and adapted to secure the hanger assembly in the housing;

an actuation member carried by the body, and comprising:

a cylindrical upper portion;

an actuator member shoulder on an outer diameter of the upper portion for landing on a tag shoulder in the housing;

a leg joined to and extending downward from an inner diameter of the upper portion, the leg having a lesser radial thickness than the upper portion, defining a downward facing shoulder in a plane perpendicular to the axis and located on a lower side of the upper portion;

a fillet joining the leg with the downward facing shoulder;

a leg rib on an inner diameter of the leg that initially abuts a lower surface of the body rib for preventing immediate downward movement of the hanger assembly relative to the actuator member as the actuator member shoulder lands on the tag shoulder; wherein

increased downward force on the hanger assembly after the actuator member shoulder has landed on the tag shoulder is adapted to cause the leg to elastically deflect, moving the leg rib radially outward from the lower surface of the body rib to enable the body rib to move downward past the leg rib to cause the load member to move into engagement with the housing assembly; and

a retainer ring secured to the hanger below the actuation member to retain the actuation member on the hanger.

19. The well system according to claim **18**, wherein:

the retainer ring has a lower portion in physical engagement with the body and an upper portion comprising a cylindrical wall that extends around the leg of the actuator member.

20. The well system according to claim **19**, wherein the cylindrical wall has a rim located below the downward facing shoulder of the actuator member.

21. The well system according to claim **20**, wherein the retainer ring has an upward facing shoulder located at an upper end of the lower portion of the retainer ring and extending inward from a base of the cylindrical wall.

22. The well system according to claim **18**, wherein the fillet has an upper portion that is at a higher elevation than the downward facing shoulder of the actuator member.