CLAIMS

1. An annular seal and lockdown assembly between a hanger and a wellhead housing, comprising:

a seal assembly between the hanger and the wellhead housing, the seal assembly having an energized position;

a supporting structure comprising a rigid portion of an actuator ring, a flexible portion of the actuator ring, and a lockdown ring;

a first load path directed, when the seal assembly is in the energized position, from the hanger through the rigid portion of the actuator ring to the seal assembly with a first position of the hanger relative to the seal assembly being fixed; and

a second load path directed from the wellhead housing through the lockdown ring, through the flexible portion of the actuator ring, and to the seal assembly with a second position of the lockdown ring relative to the wellhead housing to vary as the seal assembly is energized and as the flexible portion disrupts.

2. The annular seal assembly of claim 1, wherein the flexible portion of the actuator ring is capable of compression when a load is applied to the seal assembly.

3. The annular seal assembly of claim 1, wherein the flexible portion of the actuator ring is selected from the group consisting of a bladder, one or more collapsible or compressible members, and a combination of a collet and bump.

4. The annular seal assembly of claim 1, wherein the actuator ring further comprises a first tapered surface, and the lockdown ring comprises a second tapered surface, the first tapered surface and the second tapered surface interacting to form a tapered interface of the supporting structure, relative axial movement between the actuator ring and the lockdown ring at the tapered interface acting to drive the lockdown ring toward the wellhead housing.

5. The annular seal assembly of claim 1, wherein the rigid portion of the actuator ring includes a pin, and the flexible portion of the actuator ring defines a notch adapted to receive the pin to maintain relative positions of the rigid portion and the flexible portion of the actuator ring while inserting or removing the support structure into or away from between the hanger and the wellhead housing.

6. The annular seal assembly of claim 1, further comprising:

protrusions on the lockdown ring to engage the wellhead housing when the seal assembly is in the energized position.

7. A method for decoupling a seal assembly from reactive forces in a supporting structure, the supporting structure including an actuator ring having a rigid portion and a flexible portion, and a lockdown ring, the method comprising the steps of:

a) enabling a first load path directed from a hanger through the rigid portion of the actuator ring to the seal assembly with a first position of the hanger relative to the seal assembly being fixed; and

b) enabling a second load path directed from a wellhead housing through the lockdown ring, through the flexible portion of the actuator ring, and to the seal assembly with a

second position of the lockdown ring relative to the wellhead housing to vary as the seal assembly is energized and as the flexible portion disrupts.

8. The method of claim 7, further comprising the step of:

compressing the flexible portion of the actuator ring to allow for positional variation between the wellhead housing and the lockdown ring.

9. The method of claim 8, further comprising the step of:

dissipating the reactive forces in the flexible portion of the actuator ring to prevent the reactive forces from reaching the seal assembly.

10. The method of claim 9, wherein the flexible support member is a spring and the step of dissipating the reactive forces in the flexible support member comprises compressing the spring.

11. The method of claim 9, wherein the flexible support member is a bladder and the step of dissipating the reactive forces in the flexible support member comprises collapsing the bladder.

12. The method of claim 9, wherein the flexible support member is a collet and a bump and the step of dissipating the reactive forces in the flexible support member comprises driving the collet past the bump.

13. The method of claim 9, wherein the flexible support member is a dual bias washer and the step of dissipating the reactive forces in the flexible support member comprises flexing the dual bias washer inside out.