CLAIMS

1. A system for blocking ingress of debris into a riser tensioner, the system comprising:

an outer barrel;

an inner barrel arranged within the outer barrel, the inner barrel being moveable in first and second directions along an axis to reciprocate within the outer barrel;

a first sealing assembly at an upper end of the outer barrel, the first sealing assembly circumferentially surrounding the inner barrel and comprising:

a first wiper seal at a first top portion, the wiper seal arranged within a first recess of a first plurality of recesses extending into a first body of the first sealing assembly, and bearing against the inner barrel;

a first wear ring arranged within a second recess of the first plurality of recesses, the first wear ring extending from the second recess to contact the inner barrel; and

a first seal arranged within a third recess of the first plurality of recesses;

a second sealing assembly positioned above the first top portion of the first sealing assembly and formed in a second outer barrel, the second sealing assembly circumferentially surrounding the inner barrel and comprising:

a second wiper seal at a second top portion, the second wiper seal arranged within a first recess of a second plurality of recesses extending into a second body of the second sealing assembly, and bearing against the inner barrel;

a second wear ring arranged within a second recess of the second plurality of recesses, the second wear ring extending from the second recess to contact the inner barrel; and

a second seal arranged within a third recess of the second plurality of recesses; and

an upper end cap arranged on the inner barrel, the upper end cap having a cap diameter that is larger than a diameter of the inner barrel.

2. The system of claim 1, wherein the upper end cap is removably coupled to the inner barrel and the second sealing assembly has a continuous cylindrical body with an inner diameter that is larger than the diameter of the inner barrel.

3. The system of claim 1, wherein the second sealing assembly includes a seam, the seam separating the second sealing assembly into a first portion and a second portion.

4. The system of claim 3, wherein each of the first and second portions of the second sealing assembly include holes extending through an outer diameter of the secondary sealing assembly, in a direction substantially transverse to the axis, that align when the first and second portions are mated together.

5. The system of claim 3, wherein the first and section portions are coupled together via a fastener, a clamp, an adhesive, or a combination thereof.

6. The system of claim 1, wherein each of the first and second sealing assembly comprise apertures, the apertures arranged to align when the second sealing assembly is stacked on the first sealing assembly such that fasteners extend through respective apertures to couple the second sealing assembly to the first sealing assembly.

7. The system of claim 1, wherein a stroke length of the inner barrel is reduced after the second sealing assembly is coupled to the first sealing assembly.

8. A system for applying a force to a rig, the system comprising:

a riser tensioner having a piston cylinder arrangement for applying the force to the rig, the piston cylinder arrangement comprising an inner barrel positioned within an outer barrel, the inner barrel being linearly moveable along an axis of the riser tensioner;

a primary sealing assembly at an upper end of the outer barrel, the primary sealing assembly including a plurality of seals positioned to block debris from entering an interior chamber of the riser tensioner, the seals bearing against the inner barrel as the inner barrel translates along the axis;

an end cap coupled to the inner barrel, the end cap having a cap diameter greater than an inner barrel outer diameter, wherein the end cap is positioned a first length from the upper end of the outer barrel when the inner barrel is in an extended position and a second length from the upper end of the outer barrel when the inner barrel is in a retracted position; and

a secondary sealing assembly arranged between the end cap and the primary sealing assembly, the secondary sealing assembly positioned in a second outer barrel and including a plurality of secondary seals positioned to block debris from entering the interior chamber of the riser tensioner, wherein the secondary sealing assembly reduces a stroke length of the inner barrel when installed above the primary sealing assembly.

9. The system of claim 8, wherein the end cap is removably coupled to the inner barrel and the secondary sealing assembly comprises a cylindrical body that wraps around the outer diameter of the inner barrel.

10. The system of claim 8, wherein the secondary sealing assembly is installed after one or more of the plurality of seals of the primary sealing assembly has been damaged or degraded.

11. The system of claim 8, wherein the secondary sealing assembly includes a seam separating the secondary sealing assembly into a first portion and a second portion.

12. The system of claim 8, wherein the first and second portions of the secondary sealing assembly are coupled together to circumferentially surround the inner barrel, the first and second portions each including one or more holes extending through respective bodies of the respective portions in a direction substantially transverse to the axis.

13. The system of claim 12, wherein the first and section portions are coupled together via a fastener, a clamp, an adhesive, or a combination thereof.

14. The system of claim 8, wherein the secondary sealing assembly includes a wiper seal at a top portion, the wiper seal having an arm that bears against the inner barrel, and in operation blocks debris from entering the interior chamber of the riser tension as the inner barrel transitions from the extended position to the retracted position.

15. The system of claim 8, wherein each of the primary and secondary sealing assemblies comprise apertures, the apertures arranged to align when the secondary sealing assembly is

stacked on the primary sealing assembly such that fasteners extend through respective apertures to couple the secondary sealing assembly to the primary sealing assembly.

16. A method of installing a secondary seal, the method comprising:

taking a riser tensioner out of service such that an inner barrel of the riser tensioner is not reciprocating along an axis of the riser tensioner, within a first outer barrel, while out of service;

positioning a second outer barrel, including a secondary sealing assembly around the inner barrel;

coupling the secondary sealing assembly to a primary sealing assembly circumferentially surrounding the inner barrel, the secondary sealing assembly arranged above the primary sealing assembly; and

bringing the riser tension back into service after the secondary sealing assembly is installed.

17. The method of claim 16, further comprising:

removing an end cap arranged on an upper end of the inner barrel, the end cap having a larger diameter than an inner barrel outer diameter; and

sliding the secondary sealing assembly along the inner barrel to couple the secondary sealing assembly to the primary sealing assembly.

18. The method of claim 16, further comprising:

splitting the secondary sealing assembly along a seam, the seam separating the secondary sealing assembly into a first portion and a second portion; and

coupling the first portion and the second portion together about the inner barrel.

19. The method of claim 18, wherein the secondary sealing assembly is installed without removing upstream components associated with the inner barrel.

20. The method of claim 16, further comprising:

limiting a stroke length of the inner barrel after installation of the secondary sealing assembly such that the inner barrel does not bottom out after installation of the secondary sealing assembly.