CLAIMS

1. A wellhead assembly comprising:

a wellhead housing having an axis;

a wellhead hanger disposed in the housing;

a valve bore in a sidewall of the wellhead hanger, the valve bore having a diameter less than a radial width of the sidewall;

a valve body axially selectively reciprocal in the valve bore between open and closed positions;

a first groove on an outer diameter of the valve body containing a first seal, the first seal being annular and removable with the valve body;

a second groove on an outer diameter of the valve body containing a second seal, the second seal being annular and removable with the valve body;

upper and lower annulus access circuits in the sidewall of the wellhead hanger that each intersect the valve bore at axially spaced apart locations and that are in communication with one another when the valve body is in the open position and that are out of communication when the valve body is in the closed position,

a valve body pressure source selectively in communication with opposing ends of the valve body and for selectively axially reciprocating the valve body between the open and closed positions;

an override head secured to an upper end of the valve body;

an override assembly selectively positioned on top of the wellhead hanger, the override assembly having an override bore, a piston in the override bore, and a latching assembly coupled to the piston for axial movement with the piston, the latching assembly having a latch on a lower end that is engageable with the override head;

a fluid pressure down stroke passage leading to the override bore above the piston for stroking the piston and the latching assembly downward;

a fluid pressure up stroke passage leading to the override bore below the piston for stroking the piston upward; wherein

in the event of failure of the valve body pressure source, fluid pressure supplied to the down stroke passage causes the latch to move downward and couple to the override head, and

fluid pressure subsequently supplied to the up stroke passage lifts the valve body upward.

2. The wellhead assembly of claim 1, wherein:

the latch and the override head having mating profiles comprising a rib and a groove that snap into engagement with each other when the latch couples to the override head.

3. The wellhead assembly of claim 1, wherein the valve body comprises an inner cavity, and upper and lower apertures formed through an outer surface of the body and that intersect the inner cavity at axially spaced apart locations, and wherein when the valve body is in the open position, the upper apertures register with the upper access circuit and the lower apertures register with the lower access circuit, so that the upper and lower access circuits are in communication with one another via the inner cavity.

4. The wellhead assembly of claim 1, wherein the valve body comprises an inner cavity, and upper and lower apertures formed through an outer surface of the body and that intersect the inner cavity at axially spaced apart locations, and wherein when the valve body is in the closed position, a solid portion of the valve body is in a path of communication between the cavity and a one of the upper or lower apertures, so that communication between the upper and lower access circuits via the inner cavity is blocked by the solid portion of the valve body.

5. The wellhead assembly of claim 1, wherein,

the latching assembly of the override assembly further comprises a rod connected between the piston and the latch; and the override assembly further comprises

a rod seal in the override bore between the piston and the latch that seals around the rod; and wherein

the up stroke passage enters the override bore between the rod seal and the piston.

6. The wellhead assembly of claim 5, wherein the latch comprises:

an inner sleeve in the override bore;

an outer sleeve in the override bore surrounding the inner sleeve, the outer sleeve being axially movable with the inner sleeve, protruding below the inner sleeve, and configured to slide over the override head when the latch couples to the override head,

the inner sleeve being configured to slide into a recess in the override head when the latch couples to the override head; and wherein

the inner sleeve and the override head have mating profiles that cause the inner sleeve to snap into engagement with the override head when the latch couples to the override head.

7. The wellhead assembly of claim 5, wherein the override assembly further comprise:

a housing having an interior that defines the override bore, the housing extending downward past the latch while the piston is in a lowermost position.

8. The wellhead assembly of claim 5, wherein the override assembly is mounted in a running tool that is used for landing the wellhead hanger in the wellhead housing.

9. The wellhead assembly of claim 5, wherein the override assembly is mounted in a subsea tree that is landed on the wellhead housing.

10. The wellhead assembly of claim 1, wherein the wellhead hanger is a tubing hanger.

11. The wellhead assembly of claim 1, wherein the valve body comprises a cylindrical member having a valve body axis that coincides with an axis of the valve bore.

12. A wellhead assembly comprising:

a wellhead housing having an axis;

a wellhead hanger landed in the housing, the wellhead hanger having an annulus valve bore in a sidewall of the wellhead hanger;

an annulus defined between tubulars in the wellhead housing;

an annulus access circuit having an end in communication with the annulus and that intersects the annulus valve bore in the wellhead hanger;

a valve member in the valve bore, the valve member having a diameter less than a radial width of the sidewall of the wellhead hanger, and that is selectively axially movable into a blocking position in the annulus access circuit and has a first seal and a second seal that are removable with the valve member to isolate portions of the annulus access circuit that are on opposing ends of the valve member when the valve member is in the blocking position;

a valve member hydraulic circuit in selective communication with the opposing ends of the valve member and that selectively axially moves the valve member axially in the valve bore between the blocking position and an open position;

a valve rod secured to the valve member, extending upward in the valve bore and protruding above the wellhead hanger, the valve rod being axially movable in unison with the valve member,

a valve rod seal at an upper end of the valve bore that seals the valve rod to the valve bore;

an override head secured to an upper end of the valve rod above the valve bore;

an override assembly selectively positioned on top of the wellhead hanger, the override assembly having an override bore, a piston in the override bore, and a latching assembly coupled to the piston for axial movement with the piston, the latching assembly having a latch on a lower end that is engageable with the override head;

a fluid pressure down stroke passage leading to the override bore above the piston for stroking the piston and the latching assembly downward into engagement with the override head;

a fluid pressure up stroke passage leading to the override bore below the piston for stroking the piston upward; wherein

in the event of failure of the valve member hydraulic circuit, fluid pressure supplied to the down stroke passage causes the latch to move downward and couple to the override head, and

fluid pressure subsequently supplied to the up stroke passage moves the latch and the valve body upward in unison.

13. The wellhead assembly of claim 12, wherein,

the latch and the override head have mating profiles that latch into engagement with each other when the latch is moved downward against the override head.

14. The wellhead assembly of claim 13, wherein the latching assembly further comprises an override rod connected between the piston and the latch; and the override assembly further comprises

an override rod seal in the override bore that seals around the override rod between the piston and the latch, and wherein

the up stroke passage enters the override bore between the override rod seal and the piston.

15. The wellhead assembly of claim 13, wherein the latching assembly comprises:

an inner sleeve in the override bore;

an outer sleeve in the override bore surrounding the inner sleeve, the outer sleeve being axially movable with the inner sleeve, protruding below the inner sleeve, and configured to slide over the override head when the latch couples to the override head,

the inner sleeve being configured to slide into a recess in the override head when the latch couples to the override head; and wherein

the inner sleeve and the override head have mating profiles that cause the inner sleeve to snap into engagement with the override head when the latch couples to the override head.

16. The wellhead assembly of claim 12, wherein the override assembly further comprises:

a housing having an interior that defines the override bore, the housing extending downward past the latch while the piston is in a lowermost position.

17. The wellhead assembly of claim 12, wherein the valve member comprises a cylindrical member having a valve body axis that coincides with an axis of the valve bore.

18. The wellhead assembly of claim 12, wherein the hydraulic circuit comprises a pressurized fluid passage formed through the wellhead hanger having an end in communication with a pressure source.

19. A wellhead assembly comprising:

a wellhead housing having a central axis;

a wellhead hanger disposed in the housing;

a valve bore in a sidewall of the wellhead hanger;

a valve body axially selectively axially reciprocal in the valve bore between open and closed positions;

upper and lower annulus access circuits in the sidewall of the wellhead hanger and that each intersect the valve bore at axially spaced apart locations and that are in communication with one another when the valve body is in the open position and that are out of communication when the valve body is in the closed position;

a first groove on an outer diameter of the valve body containing a first seal, the first seal being annular and removable with the valve body;

a second groove on an outer diameter of the valve body containing a second seal, the second seal being annular and removable with the valve body;

a valve rod secured to the valve body, extending upward in the valve bore and protruding above the wellhead hanger, the valve rod being axially movable in unison with the valve body,

a valve rod seal at an upper end of the valve bore that seals the valve rod to the valve bore;

a valve body pressure source selectively in communication with the valve bore at opposing ends of the valve body for selectively axially reciprocating the valve body between the open and closed positions;

an override head secured to an upper end of the valve rod above the valve bore;

an override housing selectively positioned on top of the wellhead hanger, the override housing having an override bore;

a piston in the override bore;

an override rod secured to and extending downward in the override bore from the piston;

a latch on a lower end of the override rod, the latch and the override head having mating profiles that snap the latch and the override head into engagement with each other when the latch is moved downward into contact with the override head;

a fluid pressure down stroke passage leading to the override bore above the piston for stroking the piston, the override rod and the latch downward,

a fluid pressure up stroke passage leading to the override bore below the piston for stroking the piston, the override rod and the latch upward;

an override rod seal sealing around the override rod in the override bore between the piston and the latch, wherein

in the event of failure of the valve body pressure source, fluid pressure supplied to the down stroke passage causes the latch to move downward and connect to the override head; and

fluid pressure subsequently supplied to the up stroke passage moves the latch and the valve body upward in unison.

20. The wellhead assembly of claim 19, wherein a central axis of the valve bore extends through the sidewall and is offset from the central axis of the wellhead hanger.