

SUMMARY

[0005] In at least one aspect, there is provided a connection assembly for connecting components of a wellsite. The wellsite has a wellbore extending into a subsurface formation. The connection assembly includes a female connector having an end operatively connectable to a first of the components and a cavity extending therein; a removable wear insert positionable in the cavity and connected to an inner diameter of the female connector; a floating cartridge positionable in the cavity of the female connector and laterally movable therein, the floating cartridge axially restricted between the wear insert and the female connector and a male connector operatively connectable to a second of the components. The male connector is receivable in the cavity of the female connector and operatively connectable to the floating cartridge such that the male connector and the female connector are movably positionable relative to each other by the floating cartridge whereby a misalignment between the wellsite components is tolerated.

[0006] The female connector may include a housing having a bore therethrough in communication with the first of the components. The housing may include an upper housing and a lower housing having an interface therebetween. The floating cartridge is positionable in one of the upper and lower housings. The male connector has a bore therethrough in fluid communication with the second of the components. The female connector has a bore therethrough in fluid communication with the first of the components and the bore of the male connector.

[0007] The connection assembly may also include a wear insert positionable in the female connector. The wear insert has a bore therethrough in fluid communication with the bore of the female connector and the bore of the male connector. The wear insert is positioned between the upper housing and the floating cartridge. The floating cartridge has an outer diameter smaller than an inner diameter of the lower housing. The male connector has an outer diameter positionable adjacent an inner diameter of the floating cartridge. Opposite ends of the floating cartridge are positionable in the cavity of the female connector and against an inner wall of the female connector to restrict axial movement thereof. An end of the floating cartridge is positionable against a wear insert in the female connector to restrict axial movement thereof. The connection assembly may also include at least one seal. One of the female connector or an

end of the male connector is fixed, and another of the female connector and an end of the male connector is movable.

[0008] In another aspect, there is provided a wellsite system for connecting components of a wellsite, the wellsite having a wellbore extending into a subsurface formation. The wellsite system includes a first wellsite component, a second wellsite component, and a connection assembly. The connection assembly includes a female connector having an end operatively connectable to a first of the wellsite components and a cavity extending therein; a removable wear insert positionable in the cavity and connected to an inner diameter of the female connector; a floating cartridge positionable in the cavity of the female connector and laterally movable therein, the floating cartridge axially restricted between the wear insert and the female connector and a male connector operatively connectable to the second wellsite component. The male connector is receivable in the cavity of the female connector and operatively connectable to the floating cartridge such that the male connector and the female connector are movably positionable relative to each other by the floating cartridge whereby a misalignment between the wellsite components is tolerated. The wellsite components include choke and kill lines, a low marine riser pump, a blowout preventer, a riser and combinations thereof.

[0009] In yet another aspect, there is provided a method of connecting components of a wellsite, the wellsite having a wellbore extending into a subsurface formation. The method involves providing a connection assembly comprising a female connector having an end operatively connectable to a first of the components and a cavity extending therein, a removable wear insert positionable in the cavity and connected to an inner diameter of the female connector, a floating cartridge positioned in the cavity of the female connector and laterally movable therein, the floating cartridge axially restricted between the wear insert and the female connector and a male connector operatively connectable to a second of the components, the male connector receivable in the cavity of the female connector and operatively connectable to the floating cartridge, operatively connecting the end of the female connector to the first of the components and the male connector to the second of the components, operatively connecting an end of the male connector to the floating cartridge in the female connector, and movably positioning the male connector and the female connector relative to each other by movement of the floating cartridge whereby a misalignment between the wellsite components is tolerated.

[0010] The method may also involve preventing wear by positioning the wear insert in the cavity of the female connector, or providing at least one seal about one of the female connector, the male connector, the floating cartridge and combinations thereof.

[0011] ~~In another aspect~~As disclosed, there is provided a connection assembly for connecting components of a wellsite, the wellsite having a wellbore extending into a subsurface formation. The connection assembly includes a female connector having a cavity extending therein, a floating cartridge having an end operatively connectable to a first of the components, the floating cartridge operatively connectable to the female connector and laterally movable therein, and a male connector. The male connector includes a pivoting joint having a component end operatively connectable to the second of the components and a cartridge end operatively connectable to the floating cartridge to provide pivotal movement therebetween such that the male connector and the female connector are movably positionable relative to each other whereby a misalignment between the wellsite components is tolerated.

[0012] The male connector and the female connector may each have bores therethrough in fluid communication with the first and second components. The female connector may include a female housing and the male connector includes a male housing. The male housing may be

operatively connectable to the female housing, and the male housing may have the joint and a portion of the floating cartridge therein.

[0013] The joint has a passage therethrough in fluid communication with the first and second components. The floating cartridge includes a piston ring slidably positionable in a piston chamber of the female connector. The piston chamber has walls restricting axial movement of the floating cartridge. The floating cartridge has a cavity therein to pivotally receive the cartridge end of the joint. The male connector may include a male housing operatively connectable to the second component, and the housing may have a joint cavity therein to pivotally receive the component end of the joint.

[0014] The joint may include a fixed socket and a pivotal sphere at each of the component end and the cartridge end. The joint may include a pivoting channel extending between the cartridge end and the component end. The pivoting channel has a bore therethrough in fluid communication with the first and the second components. The connection assembly may also include at least one seal. The female connector or an end of the male connector is fixed, and another of the female connector or an end of the male connector is movable.

[0015] ~~In yet another aspect~~As disclosed, there is provided a wellsite system for connecting components of a wellsite, the wellsite having a wellbore extending into a subsurface formation. The wellsite system includes a first component, a second component, and a connection assembly. The connection assembly includes a female connector having a cavity extending therein, a floating cartridge having an end operatively connectable to the first of the components, the floating cartridge operatively connectable to the female connector and laterally movable therein, and a male connector comprising a pivoting joint having a component end operatively connectable to the second component and a cartridge end operatively connectable to the floating cartridge to provide pivotal movement therebetween such that the male connector and the female connector are movably positionable relative to each other whereby a misalignment between the wellsite components is tolerated. The wellsite components may include choke and kill lines, a low marine riser pump, a blowout preventer, a riser and combinations thereof.

[0016] ~~Finally, in another aspect~~As disclosed, there is provided a method of connecting components of a wellsite, the wellsite having a wellbore extending into a subsurface formation. The method involves providing a connection assembly comprising

a female connector having a cavity extending therein, a floating cartridge having an end operatively connectable to a first of the components, the floating cartridge operatively connectable to the female connector and laterally movable therein, and a male connector comprising a pivoting joint having a component end operatively connectable to a second of the components and a cartridge end operatively connectable to the floating cartridge to provide pivotal movement therebetween, operatively connecting the end of the floating cartridge to the first of the components and to the female connector, operatively connecting the male connector to the second of the components and the joint of the male connector to the floating cartridge, and movably positioning the male connector and the female connector relative to each other by movement of the floating cartridge whereby a misalignment between the wellsite components is tolerated. This may also involve providing at least one seal about one of the female connector, the male connector, the floating cartridge and combinations thereof.

CLAIMS

What is claimed is:

1. A connection assembly for connecting components of a wellsite, the wellsite having a wellbore extending into a subsurface formation, the connection assembly comprising:
 - a female connector having an end operatively connectable to a first of the components and a cavity extending therein;
 - a removable wear insert positionable in the cavity and connected to an inner diameter of the female connector;
 - a floating cartridge positionable in the cavity of the female connector and laterally movable therein, the floating cartridge axially restricted between the wear insert and the female connector; and
 - a male connector operatively connectable to a second of the components, the male connector receivable in the cavity of the female connector and operatively connectable to the floating cartridge such that the male connector and the female connector are movably positionable relative to each other by the floating cartridge whereby a misalignment between the wellsite components is tolerated.
2. The connection assembly of Claim 1, wherein the female connector comprises a housing having a bore therethrough in communication with the first of the components.
3. The connection assembly of Claim 2, wherein the housing comprises an upper housing and a lower housing having an interface therebetween.
4. The connection assembly of Claim 3, wherein the floating cartridge is positionable in one of the upper and lower housings.
5. The connection assembly of Claim 1, wherein the male connector has a bore therethrough in fluid communication with the second of the components.
6. The connection assembly of Claim 5, wherein the female connector has a bore therethrough in fluid communication with the first of the components and the bore of the male connector.
- ~~7. The connection assembly of Claim 1, further comprising a wear insert positionable in the female connector.~~
- ~~8.7.~~ The connection assembly of Claim ~~7~~1, wherein the wear insert has a bore therethrough in

fluid communication with the bore of the female connector and the bore of the male connector.

9.8. The connection assembly of Claim 1, wherein the floating cartridge has an outer diameter smaller than an inner diameter of a lower housing.

~~10.9.~~ The connection assembly of Claim 1, wherein the male connector has an outer diameter positionable adjacent an inner diameter of the floating cartridge.

~~11.10.~~ The connection assembly of Claim 1, wherein opposite ends of the floating cartridge are positionable in the cavity of the female connector and against an inner wall of the female connector to restrict axial movement thereof.

~~12.11.~~ The connection assembly of Claim ~~11.10~~, wherein an end of the floating cartridge is positionable against ~~a~~ the wear insert in the female connector to restrict axial movement thereof.

~~13.12.~~ The connection assembly of Claim 1, further comprising at least one seal.

~~14.13.~~ The connection assembly of Claim 1, wherein ~~one of the female connector and an end of the male connector is fixed and wherein another of the female connector and the end of the male connector is~~ movable.

~~15.14.~~ A wellsite system for connecting components of a wellsite, the wellsite having a wellbore extending into a subsurface formation, the wellsite system comprising:

a first wellsite component;

a second wellsite component; and

a connection assembly, comprising:

a female connector having an end operatively connectable to ~~a~~ the first of the wellsite components and a cavity extending therein;

a removable wear insert positionable in the cavity and connected to an inner diameter of the female connector;

a floating cartridge positionable in the cavity of the female connector and laterally movable therein, the floating cartridge axially restricted between the wear insert and the female connector; and

a male connector operatively connectable to the second wellsite component, the male connector receivable in the cavity of the female connector and operatively connectable to the floating cartridge such that the male connector and the female connector are movably positionable relative to each other by the floating cartridge whereby a misalignment between the wellsite components is tolerated.

~~16.15.~~ The wellsite system of Claim ~~15.14~~ wherein the wellsite components comprise choke and kill lines, a low marine riser pump, a blowout preventer, a riser and combinations thereof.

~~17.16.~~ A method of connecting components of a wellsite, the wellsite having a wellbore extending into a subsurface formation, the method comprising:

providing a connection assembly comprising:

a female connector having an end operatively connectable to a first of the components and a cavity extending therein;

a removable wear insert positionable in the cavity and connected to an inner diameter of the female connector;

a floating cartridge positioned in the cavity of the female connector and laterally movable therein, the floating cartridge axially restricted between the wear insert and the female connector; and

a male connector operatively connectable to a second of the components, the male connector receivable in the cavity of the female connector and operatively connectable to the floating cartridge;

operatively connecting the end of the female connector to the first of the components and the male connector to the second of the components;

operatively connecting an end of the male connector to the floating cartridge in the female connector; and

movably positioning the male connector and the female connector relative to each other by movement of the floating cartridge whereby a misalignment between the wellsite components is tolerated.

~~18.17.~~ The method of Claim ~~17~~16, further comprising providing at least one seal about one of the female connector, the male connector, the floating cartridge and combinations thereof.

~~19.~~ ~~A connection assembly for connecting components of a wellsite, the wellsite having a wellbore extending into a subsurface formation, the connection assembly comprising:~~

~~a female connector having a cavity extending therein;~~

~~a floating cartridge having an end operatively connectable to a first of the components, the floating cartridge operatively connectable to the female connector and laterally movable therein; and~~

~~a male connector comprising a pivoting joint having a component end operatively connectable to the second of the components and a cartridge end operatively connectable to the floating cartridge to provide pivotal movement therebetween such that the male connector and the female connector are movably positionable~~

~~relative to each other whereby a misalignment between the wellsite components is tolerated.~~

~~20. The connection assembly of Claim 19, wherein the male connector and the female connector each have bores therethrough in fluid communication with the first and second components.~~

~~21. The connection assembly of Claim 19, wherein the female connector comprises a female housing and the male connector comprises a male housing, the male housing operatively connectable to the female housing, the male housing having the joint and a portion of the floating cartridge therein.~~

~~22. The connection assembly of Claim 19, wherein the joint has a passage therethrough in fluid communication with the first and second of the components.~~

~~23. The connection assembly of Claim 19, wherein the floating cartridge comprises a piston ring slidably positionable in a piston chamber of the female connector.~~

~~24. The connection assembly of Claim 23, wherein the piston chamber has walls restricting axial movement of the floating cartridge.~~

~~25. The connection assembly of Claim 19, wherein the floating cartridge has a cavity therein to pivotally receive the cartridge end of the joint.~~

~~26. The connection assembly of Claim 19, wherein the male connector comprises a male housing operatively connectable to the second of the components, the housing having a joint cavity therein to pivotally receive the component end of the pivoting joint.~~

~~27. The connection assembly of Claim 19, wherein the joint comprises a fixed socket and a pivotal sphere at each of the component end and the cartridge end.~~

~~28. The connection assembly of Claim 19, wherein the joint comprises a pivoting channel extending between the cartridge end and the component end.~~

~~29. The connection assembly of Claim 28, wherein the pivoting channel has a bore~~

~~therethrough in fluid communication with the first and the second of the components.~~

30. ~~The connection assembly of Claim 19, further comprising at least one seal.~~

31. ~~The connection assembly of Claim 19, wherein one of the female connector and an end of the male connector is fixed and wherein another of the female connector and the end of the male connector is movable.~~

32. ~~A wellsite system for connecting components of a wellsite, the wellsite having a wellbore extending into a subsurface formation, the wellsite system comprising:~~

~~a first component;~~

~~a second component; and~~

~~a connection assembly, comprising:~~

~~a female connector having a cavity extending therein;~~

~~a floating cartridge having an end operatively connectable to the first of the components, the floating cartridge operatively connectable to the female connector and laterally movable therein; and~~

~~a male connector comprising a pivoting joint having a component end operatively connectable to the second component and a cartridge end operatively connectable to the floating cartridge to provide pivotal movement therebetween such that the male connector and the female connector are movably positionable relative to each other whereby a misalignment between the wellsite components is tolerated.~~

33. ~~The wellsite system of Claim 32, wherein the wellsite components comprise choke and kill lines, a low marine riser pump, a blowout preventer, a riser and combinations thereof.~~

~~34. A method of connecting components of a wellsite, the wellsite having a wellbore extending into a subsurface formation, the method comprising:~~

~~providing a connection assembly comprising:~~

~~a female connector having a cavity extending therein;~~

~~a floating cartridge having an end operatively connectable to a first of the components, the floating cartridge operatively connectable to the female connector and laterally movable therein; and~~

~~a male connector comprising a pivoting joint having a component end operatively connectable to a second of the components and a cartridge end operatively connectable to the floating cartridge to provide pivotal movement therebetween;~~

~~operatively connecting the end of the floating cartridge to the first of the components and to the female connector;~~

~~operatively connecting the male connector to the second of the components and the joint of the male connector to the floating cartridge; and~~

~~movably positioning the male connector and the female connector relative to each other by movement of the floating cartridge whereby a misalignment between the wellsite components is tolerated.~~

~~35. The method of Claim 34, further comprising providing at least one seal about one of the female connector, the male connector, the floating cartridge and combinations thereof.~~