CLAIMS

1. A system comprising:

a fracturing manifold;

a fracturing tree coupled to the fracturing manifold to enable receipt of fracturing fluid from the fracturing manifold;

an adjustment joint including an inlet, an outlet, and a bore to transmit the fracturing fluid through the adjustment joint, wherein the adjustment joint is configured to be varied in length to facilitate coupling of the fracturing manifold to the fracturing tree; and

a valve coupled between the fracturing manifold and the fracturing tree to control flow of fracturing fluid from the fracturing manifold to the fracturing tree, wherein the adjustment joint is disposed between the valve and the fracturing tree to enable variation in the length of a fluid connection between the valve and the fracturing tree.

2. The system of claim 1, wherein the fracturing manifold is mounted on at least one skid to enable movement of the fracturing manifold and the system includes a plurality of valves to control flow of fracturing fluid from the fracturing manifold to a plurality of fracturing trees.

3. The system of claim 2, wherein the plurality of valves includes a first valve to control flow of the fracturing fluid from the fracturing manifold to a first fracturing tree and a second valve to control flow of the fracturing fluid from the fracturing manifold to a second fracturing tree, and an additional adjustment joint is disposed in the fracturing manifold to enable variation in the distance between the first valve and the second valve.

4. The system of claim 1, comprising an additional adjustment joint disposed between the valve and the fracturing tree to enable variation in the length of the fluid connection between the valve and the fracturing tree, wherein the adjustment joint and the additional adjustment joint enable variation in the length of the fluid connection in different directions from one another.

5. The system of claim 4, wherein the different directions are orthogonal.

6. The system of claim 1, comprising two additional adjustment joints, wherein the adjustment joint and the two additional adjustment joints enable three translational degrees of freedom in aligning the fluid connection between the fracturing manifold and the fracturing tree.

7. The system of claim 1, wherein the fracturing tree is coupled to the fracturing manifold by a single fluid connection.

8. The system of claim 7, wherein the single fluid connection includes a pipe having a seven-inch bore.

9. The system of claim 1, wherein the adjustment joint includes a fracturing head.

10. The system of claim 1, wherein the adjustment joint includes a pipe connector.

11. An adjustment joint comprising:

an inlet, an outlet, and a bore to transmit a fracturing fluid through the adjustment joint, wherein the adjustment joint is configured to be varied in length to facilitate coupling of a fracturing manifold to a fracturing tree;

wherein the adjustment joint includes a pipe connector having a first collar disposed about a first tubular member and a second collar having a flange; the first collar includes an interior, threaded surface to engage a mating surface of the second collar; the flange of the second collar is coupled to a mating flange of a second tubular member; and the pipe connector is configured such that rotation of the first collar causes translation of the second collar with respect to the first collar to vary the length of the pipe connector; the first tubular member is received within the second tubular member; and the adjustment joint includes a wiper seal disposed between the first tubular member and the second tubular member.

12. The adjustment joint of claim 11, comprising at least one additional seal in an annular space bound by the first tubular member, the second tubular member, and the second collar.

13. The adjustment joint of claim 12, wherein the at least one additional seal includes a first additional seal and a second additional seal, and the adjustment joint includes a test port extending from the annular space at a position between the first additional seal and the second additional seal and through the second tubular member.

14. A method comprising:

adjusting a length of a first adjustment joint in a fracturing system to facilitate alignment of a connection between a fracturing manifold and a fracturing tree in a first dimension;

adjusting a length of a second adjustment joint in the fracturing system to facilitate alignment of the connection between the fracturing manifold and the fracturing tree in a second dimension different from the first dimension; and

adjusting a length of a third adjustment joint in the fracturing system to facilitate alignment of the connection between the fracturing manifold and the fracturing tree in a third dimension different from the first dimension and the second dimension.

15. An adjustment joint comprising:

an inlet, an outlet, and a bore to transmit a fracturing fluid through the adjustment joint, wherein the adjustment joint is configured to be varied in length to facilitate coupling of a fracturing manifold to a fracturing tree;

wherein the adjustment joint includes a pipe connector having a first collar disposed about a first tubular member and a second collar having a flange; the first collar includes an interior, threaded surface to engage a mating surface of the second collar; the flange of the second collar is coupled to a mating flange of a second tubular member; the pipe connector is configured such that rotation of the first collar causes translation of the second collar with respect to the first collar to vary the length of the pipe connector; the first tubular member is received within the second tubular member; the adjustment joint includes at least one seal in an annular space bound by the first tubular member, the second tubular member, and the second collar; the at least one seal includes a first seal and a second seal; and the adjustment joint includes a test port extending from the annular space at a position between the first seal and the second seal and through the second tubular member.

16. A system comprising:

a fracturing manifold;

a fracturing tree coupled to the fracturing manifold to enable receipt of fracturing fluid from the fracturing manifold;

an adjustment joint including an inlet, an outlet, and a bore to transmit the fracturing fluid through the adjustment joint, wherein the adjustment joint is configured to be varied in length to facilitate coupling of the fracturing manifold to the fracturing tree; and

two additional adjustment joints, wherein the adjustment joint and the two additional adjustment joints enable three translational degrees of freedom in aligning a pipe connection between the fracturing manifold and the fracturing tree.

CLAIMS

1. A system (10) comprising:

an adjustment joint (60, 62, 64, 130, 170, 224) including an inlet (114, 176), an outlet (86, 178), and a bore (98, 180) to transmit a fracturing fluid through the adjustment joint, wherein the adjustment joint is configured to be varied in length to facilitate coupling of a fracturing manifold (22) to a fracturing tree (20).

2. The system of claim 1, comprising:

the fracturing manifold; and

the fracturing tree coupled to the fracturing manifold to enable receipt of the fracturing fluid from the fracturing manifold.

3. The system of claim 2, wherein the fracturing manifold is mounted on at least one skid (24) to enable movement of the fracturing manifold and includes a plurality of valves (44, 46) to control flow of fracturing fluid from the fracturing manifold to a plurality of fracturing trees (20).

4. The system of claim 3, wherein the plurality of valves includes a first valve (44) to control flow of the fracturing fluid from the fracturing manifold to a first fracturing tree (20) and a second valve (46) to control flow of the fracturing fluid from the fracturing manifold to a second fracturing tree (20), and the adjustment joint (60, 130, 170, 224) is disposed in the fracturing manifold to enable variation in the distance between the first valve and the second valve.

5. The system of claim 2, wherein the fracturing manifold includes a valve (44) to control flow of fracturing fluid from the fracturing manifold to the fracturing tree, and the adjustment joint (62, 64, 130, 170, 224) is disposed between the valve and the fracturing tree to enable variation in the length of a fluid connection (26) between the valve and the fracturing tree.

6. The system of claim 5, comprising an additional adjustment joint (62, 64, 130, 170, 224) disposed between the valve and the fracturing tree to enable variation in the length of the fluid connection between the valve and the fracturing tree, wherein the adjustment joint and the additional adjustment joint enable variation in the length of the fluid connection in different directions (70, 72) from one another.

7. The system of claim 2, comprising two additional adjustment joints (62, 64 ,130, 170, 224), wherein the adjustment joint and the two additional adjustment joints enable three translational degrees of freedom (68, 70, 72) in aligning a pipe connection (26) between the fracturing manifold and the fracturing tree.

8. The system of claim 2, wherein the fracturing tree is coupled to the fracturing manifold by a single fluid connection (26).

9. The system of claim 1, wherein the adjustment joint includes a pipe connector (130) having a first collar (142) disposed about a first tubular member (132) and a second collar (154) having a flange (156); the first collar includes an interior, threaded surface (152) to engage a mating surface of the second collar; the flange of the second collar is coupled to a mating flange (158) of a second tubular member (134); and the pipe connector is configured such that rotation of the first collar causes translation of the second collar with respect to the first collar to vary the length of the pipe connector.

10. The system of claim 9, the adjustment joint comprising a first seal (138) and a second seal (140) in an annular space bound by the first tubular member, the second tubular member, and the second collar, and including a test port (164) extending from the annular space at a position between the first seal and the second seal and through the second tubular member.

11. The system of claim 1, wherein the adjustment joint (170, 224) includes a fluid port (200) that enables the length of the adjustment joint to be varied through hydraulic actuation.

12. The system of claim 1, wherein the adjustment joint (170, 224) includes a seal (206, 208) and a piston (186) that is positioned to set the seal in response to hydraulic pressure on the piston.

13. A method comprising:

coupling an adjustment joint (60, 62, 64, 130, 170, 224) in a fracturing system (10) including a fracturing manifold (22) and a fracturing tree (20); and

adjusting a length of the adjustment joint to facilitate alignment of a connection (26) between the fracturing manifold and the fracturing tree in a first dimension (68, 70, 72).

14. The method of claim 13, wherein adjusting the length of the adjustment joint includes hydraulically actuating the adjustment joint to extend its length.

15. The method of claim 13, wherein adjusting the length of the adjustment joint includes applying hydraulic pressure to the adjustment joint to increase the length by extending an inner tubular member (172) with respect to an outer tubular member (174) and, after the length has been increased, applying hydraulic pressure to a piston (186) of the adjustment joint to set a seal (206, 208) positioned between the inner and outer tubular members.

16. The method of claim 13, comprising:

adjusting a length of a second adjustment joint (60, 62, 64, 130, 170, 224) in the fracturing system to facilitate alignment of the connection between the fracturing manifold and the fracturing tree in a second dimension (68, 70, 72) different from the first dimension; and

adjusting a length of a third adjustment joint (60, 62, 64, 130, 170, 224) in the fracturing system to facilitate alignment of the connection between the fracturing manifold and the fracturing tree in a third dimension (68, 70, 72) different from the first dimension and the second dimension.