

CLAIMS

1. A crown plug securement system comprising securement means to secure a crown plug within an outer member of a bore wherein the securement means
5 comprises a clamping arrangement which is activated between a first configuration and a second configuration wherein, in the first configuration, a clamping member is in an unclamped configuration and enables a crown plug to be axially moved within the outer member to an axial position which is aligned with the clamping member of the clamping arrangement and, in the second configuration, the clamping
10 arrangement exerts sufficient radial force on the outer member to distort the outer member inwardly to grip the crown plug and secure the crown plug in the axial position within the bore.
2. A crown plug securement system according to Claim 1 in which the crown
15 plug comprises a unitary component.
3. A crown plug securement system according to Claim 1 or Claim 2 in which the crown plug comprises a one piece component.
- 20 4. A crown plug securement system according to any preceding claim in which in changing from an unclamped position to a clamped position the crown plug solely requires positioning at the clamping position without any manipulation of any securement elements located on the crown plug.
- 25 5. A crown plug securement system according to any preceding claim in which the crown plug is solely secured in position by the clamping arrangement.
6. A crown plug securement system according to any preceding claim in which the crown plug is solely secured in position by movement of elements located
30 externally of the outer member.
7. A crown plug securement system according to any preceding claim in which

the crown plug and the outer member create a metal to metal seal in the second configuration.

8. A crown plug securement system according to Claim 7 in which the crown
5 plug and the outer member create a full circumferential metal to metal seal in the second configuration.

9. A crown plug securement system according to any preceding claim in which
the crown plug comprises an outer sealing surface comprising a metal sealing
10 surface and an elastomeric seal.

10. A crown plug securement system according to any preceding claim in which
the crown plug comprises an outer sealing surface comprise a profiled sealing
surface wherein the profiled sealing surface comprises a series of full circumferential
15 rounded ridges extending around the outer sealing surface and wherein adjacent rounded ridges are separated by full circumferential recesses.

11. A crown plug securement system according to Claim 10 in which the outer
sealing surface comprise an upper array of rounded ridges and a lower array of
20 rounded ridges and wherein the upper array of rounded ridges locate on an upper portion of the crown plug and above a sealing member and the lower array of rounded ridges locate on a lower portion of the crown plug and below the sealing member.

25 12. A crown plug securement system according to Claim 10 or Claim 11 in which the profiled sealing surface comprises a second series of axially spaced apart ridges comprising a series of full circumferential angled ridges extending around the outer sealing surface and wherein adjacent angled ridges are separated by full circumferential recesses.

30 13. A crown plug securement system according to any preceding claim in which the outer member comprises an index shoulder which is arranged, in use to

cooperate with an index surface on the crown plug in order to align the crown plug relative to the clamping arrangement.

14. A crown plug securement system according to Claim 13 in which the index
5 surface of the crown plug is provided by a lower annular surface which is provided around a lower outer edge of the crown plug.

15. A crown plug securement system according to any preceding claim in which
an outer sealing surface of the crown plug is tapered and, wherein, the tapered outer
10 sealing surface of the crown plug is arranged to cooperate with a respective tapered portion of the outer member.

16. A crown plug securement system according to any preceding claim in which
the crown plug comprises a main body which is arranged to create a barrier across
15 the outer member and wherein the main body comprises a solid body.

17. A crown plug securement system according to Claim 16 in which the solid
body provides a bung which fills the outer member within a sealing zone and wherein
the sealing zone extends along an axial length of the outer member.

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18. A crown plug securement system according to any preceding claim in which
the crown plug comprises a tool attachment member.

19. A crown plug securement system according to Claim 18 in which the tool
25 attachment member is located on an upper surface of the crown plug.

20. A crown plug securement system according Claim 19 in which the tool
attachment member comprises a lug extending upwardly away from an upper
surface of a main body of the crown plug.

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21. A crown plug securement system according to Claim 19 in which the tool
attachment member comprises a recess extending inwardly into the crown plug.

22. A crown plug securement system according to any preceding claim in which, in the first position, an outer sealing surface of the crown plug is arranged to locate at a longitudinal position in which an outer sealing surface is movable relative to an inner surface provided in the outer member in order to enable the crown plug to move within the outer member.

23. A crown plug securement system according to any preceding claim in which the clamping arrangement comprises a collar having an externally tapered surface, the arrangement may also include an annular component with an internally tapered surface and wherein the collar and the annular component are relatively axially moveable between a first position in which the tapered surface of the annular component exerts no radial force on the collar and a second position which the tapered surface of the annular component exerts sufficient radial force to distort the collar inwardly to grip the crown plug.

24. A wellhead including a securement arrangement for securing a crown plug within the wellhead, the securement arrangement being in accordance with any one of Claim 1 to Claim 23.

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25. A method of securing a crown plug within a wellhead comprising activating securement means to secure the crown plug within an outer member of a bore wherein the securement means comprises a clamping arrangement, the method comprising activating the clamping arrangement between a first configuration and a second configuration wherein, in the first configuration, a clamping member is in an unclamped configuration and enables the crown plug to be axially moved within the outer member to an axial position which is aligned with the clamping member of the clamping arrangement and, in the second configuration, the clamping arrangement exerts sufficient radial force on the outer member to distort the outer member inwardly to grip the crown plug and secure the crown plug in the axial position within the bore.

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