

CLAIMS

1. A collet shifting tool for engaging an internal profile of a shifting sleeve, the collet shifting tool comprising:

a tubular collet sleeve,

the tubular collet sleeve having an outer sleeve wall,

the outer sleeve wall defining an internal sleeve cavity,

the outer sleeve wall comprising a flexible portion,

the flexible portion being deformable in a radial direction into the internal sleeve cavity,

the flexible portion having at least one engagement profile adapted to engage the internal profile of the shifting sleeve;

a collet mandrel,

the collet mandrel being sized to fit within the internal sleeve cavity,

the collet mandrel having an outer mandrel wall,

the outer mandrel wall comprising a raised wall portion;

wherein the outer mandrel wall further comprises at least one finger, the at least one finger being resiliently biased in a radial direction out of the internal mandrel cavity;

a primary shear mechanism positioned to restrict movement of the collet mandrel through the internal sleeve cavity, the primary shear mechanism being adapted to break at a first shear force; and

a secondary shear mechanism positioned to restrict movement of the collet mandrel through the internal sleeve cavity and thereby to align the raised wall portion of the tubular collet mandrel with the flexible portion of the tubular collet sleeve to prevent deformation of the flexible portion of the tubular collet sleeve in the radial direction into the internal sleeve cavity,

the secondary shear mechanism being adapted to break at a second shear force;

and wherein the collet shifting tool further comprising a collet tip, disposed within the internal sleeve cavity and having at least one abutment profile adapted to engage the at least one finger of the tubular collet mandrel.

2. The collet shifting tool according to Claim 1, wherein the outer mandrel wall further comprises a recessed wall portion, and wherein the recessed wall portion of the tubular collet mandrel is positioned and sized to permit deformation of the flexible portion of the tubular collet sleeve in the radial direction into the internal sleeve cavity when the at least one finger engages the at least one abutment profile of the collet tip.

3. The collet shifting tool according to Claim 1, wherein the first shear force is less than the second shear force.

4. The collet shifting tool according to Claim 1, wherein the first shear force is in a range of from about 100 to about 2,000 pounds.

5. The collet shifting tool according to Claim 1, wherein the second shear force is in a range of from about 5,000 to about 40,000 pounds.

6. The collet shifting tool according to Claim 1, wherein the engagement profile comprises a first protrusion and a second protrusion.

7. The collet shifting tool according to Claim 1, wherein the flexible portion of the tubular collet sleeve comprises a plurality of longitudinal arms, defined by a plurality of longitudinal slots in the outer wall of the collet sleeve.

8. The collet shifting tool according to Claim 1, wherein the outer wall of the tubular collet sleeve comprises at least one through hole adapted to engage the primary shear mechanism.

9. The collet shifting tool according to Claim 1, wherein the outer wall of the tubular collet sleeve comprises at least one through hole adapted to engage the secondary shear mechanism.

10. The collet shifting tool according to Claim 1, wherein the secondary shear mechanism is slidably disposed within the internal cavity of the collet sleeve.

11. A method for engaging an internal profile of a shifting sleeve via a collet shifting tool comprising a tubular collet sleeve and a collet mandrel, the method comprising:

inserting the collet shifting tool into a wellbore;

engaging the internal profile of the shifting sleeve with at least one engagement profile of the collet shifting tool;

holding a raised wall portion of the collet mandrel relative to the at least one engagement profile to prevent disengagement of the at least one engagement profile with the internal profile of the shifting sleeve until a predetermined force is applied.

12. The method according to Claim 11, wherein holding the raised

wall portion of the collet mandrel relative to the at least one engagement profile comprises pressing the collet mandrel against a secondary shear mechanism.

13. The method according to Claim 12, wherein the secondary shear mechanism is adapted to break at the predetermined force.

14. The method according to Claim 11, further comprising engaging at least one finger of the collet mandrel with an abutment profile of the collet shifting tool to lock the collet mandrel in place relative to the collet sleeve.

15. The method according to Claim 14, further comprising aligning a recessed wall portion of the collet mandrel with the at least one engagement profile.

16. The method according to Claim 15, further comprising applying force in a direction suitable to withdraw the collet shifting tool from the wellbore.

17. The method according to Claim 16, further comprising allowing the at least one engagement profile to disengage from the internal profile of the shifting sleeve by deforming into the recessed wall portion of the collet mandrel.

18. The method according to Claim 17, further comprising reengaging the internal profile of the shifting sleeve with the at least one engagement profile of the collet shifting tool.