

What is claimed is:

1. A system for activating a down hole tool, the system comprising:
a base pipe having an interior and defining a port that communicates with a pressure chamber positioned outside of the base pipe; and
a sleeve positioned in the interior to substantially block the port and to prevent substantial fluid communication between the interior and the pressure chamber, the sleeve having a first portion engaging the base pipe and a second portion engaging the first portion, the first portion having a first shear resistance for resisting movement of the first portion with respect to the base pipe, and the second portion having a second shear resistance for resisting movement of the second portion with respect to the first portion, wherein movement of the first portion with respect to the base pipe in response to overcoming the first shear resistance exposes the port to permit fluid communication between the interior and the pressure chamber for activating the down hole tool.
2. The system of claim 1, further comprising a piston communicating with the pressure chamber and being moveable in response to pressurization of the pressure chamber to set the down hole tool.
3. The system of claim 2, wherein the down hole tool is an annular casing packer and movement of the piston sets the packer.
4. The system of claim 1, further comprising a stop member positioned in the base pipe down hole of the sleeve, the stop member being sized to limit down hole movement of the first portion beyond the stop member, and sized to permit down hole movement of the second portion beyond the stop member.
5. The system of claim 4, wherein the second portion moves beyond the stop member in response to overcoming the second shear resistance.
6. The system of claim 1, wherein the second shear resistance is greater than the first shear resistance.

7. The system of claim 1, further comprising a plug engageable with the sleeve to substantially plug the interior, the plug having an engagement member including a plug outer diameter that is less than an inner diameter of the first portion.

8. The system of claim 7, further comprising a stop member positioned in the base pipe down hole of the sleeve and being sized to limit down hole movement of the first portion beyond the stop member and further sized to permit down hole movement of the second portion and the plug beyond the stop member.

9. The system of claim 1, wherein the sleeve is substantially annular, and wherein the first portion is an outer annular portion and wherein the second portion is an inner annular portion.

10. A sleeve assembly movably arranged within a base pipe, comprising:

a first portion having a first shear resistance for resisting movement of the sleeve assembly with respect to the base pipe; and

a second portion moveable with respect the first portion and having a second shear resistance for resisting movement of the second portion with respect to the first portion, the second shear resistance being greater than the first shear resistance.

11. The sleeve assembly of claim 10, wherein the first portion is an outer annular portion and includes a first portion outer surface opposable with a base pipe inner surface, the sleeve assembly further comprising a first shear assembly disposed about the first portion outer surface and engageable with the base pipe inner surface, the first shear assembly providing the first shear resistance.

12. The sleeve assembly of claim 11, wherein the second portion is an inner annular portion and includes a second portion outer surface facing a first portion inner surface, the sleeve assembly further comprising a second shear assembly between the second portion outer surface and the first portion inner surface, the second shear assembly providing the second shear resistance.

13. The sleeve assembly of claim 12, wherein at least one of the first shear assembly and the second shear assembly comprises at least one seal.

14. A method for activating a tool in a down hole system, the method comprising:

landing a plug on a double shearing sleeve movably arranged within a base pipe between a first position, where one or more ports defined in the base pipe are blocked, and a second position, where the one or more ports are exposed and provide fluid communication between an interior of the base pipe and a pressure chamber positioned outside of the base pipe, the sleeve having a first portion engaging a base pipe and a second portion engaging the first portion;

pressurizing the interior of the base pipe up hole of the plug to overcome a first shearing resistance between the first portion and the base pipe, thereby moving the sleeve to the second position;

pressurizing the pressure chamber via the one or more ports to activate the down hole tool; and

increasing a pressure of the base pipe to overcome a second shearing resistance between the first and second portions, thereby moving the second portion and the plug in a down hole direction away from the first portion.

15. The method of claim 14, further comprising preventing down hole movement of the first portion beyond the second position by engaging the first portion with a stop member positioned in the interior, the stop member being sized to prevent down hole movement of the first portion beyond the stop member and further sized to permit down hole movement of the second portion and the plug beyond the stop member.

16. The method of claim 14, wherein pressurizing the interior of the base pipe up hole of the plug comprises pressurizing the interior to a first value, and wherein pressurizing the pressure chamber via the one or more ports comprises pressurizing the interior to a second value that is greater than the first value.

17. The method of claim 16, wherein increasing a pressure of the base pipe comprises pressurizing the interior of the base pipe to a third value that is greater than the second value.

18. The method of claim 14, wherein landing the plug on the double shearing sleeve comprises engaging an engaging member of the plug with the second portion of the sleeve.

19. The method of claim 14, wherein pressurizing the pressure chamber via the one or more ports further comprises:

moving a piston that is in communication with the pressure chamber; and
expanding annular casing packer with the piston.

20. The method of claim 14, wherein overcoming the first shearing resistance includes overcoming a first shear assembly between the base pipe and the first portion.

What is claimed is:

1. A system for activating a down hole tool, the system comprising:
 - a base pipe having an interior and defining a port that communicates with a pressure chamber positioned outside of the base pipe;
 - a sleeve positioned in the interior to substantially block the port and to prevent substantial fluid communication between the interior and the pressure chamber, the sleeve having a first portion engaging the base pipe and a second portion engaging the first portion, the first portion having a first shear resistance for resisting movement of the first portion with respect to the base pipe, and the second portion having a second shear resistance for resisting movement of the second portion with respect to the first portion, wherein movement of the first portion with respect to the base pipe in response to overcoming the first shear resistance exposes the port to permit fluid communication between the interior and the pressure chamber for activating the down hole tool;
 - a stop member positioned in the base pipe down hole of the sleeve, the stop member being sized to limit down hole movement of the first portion beyond the stop member, and sized to permit down hole movement of the second portion beyond the stop member; and
 - a plug engageable with the sleeve to substantially plug the interior, wherein the plug includes an engagement member located at an uphole end of the plug and having an outer diameter less than an inner diameter of the first portion, and further includes a plurality of wiper members at a downhole end of the plug that flex to traverse the sleeve and the stop member.
2. The system of claim 1, further comprising a piston communicating with the pressure chamber and being moveable in response to pressurization of the pressure chamber to set the down hole tool.
3. The system of claim 2, wherein the down hole tool is an annular casing packer and movement of the piston sets the packer.
4. The system of claim 1, wherein the second portion moves beyond the stop member in response to overcoming the second shear resistance.

5. The system of claim 4, wherein, when the second portion moves beyond the stop member in response to overcoming the second shear resistance, the second member is released from the system.

6. The system of claim 1, wherein the second shear resistance is greater than the first shear resistance.

7. The system of claim 1, wherein the stop member is further sized to permit down hole movement of the plug beyond the stop member.

8. The system of claim 1, wherein the sleeve is substantially annular, and wherein the first portion is an outer annular portion and wherein the second portion is an inner annular portion.

9. A method for activating a tool in a down hole system, the method comprising:

landing a plug on a double shearing sleeve by engaging an engaging member of the plug located at an uphole end thereof with the sleeve and the sleeve with a plurality of wiper members located at a downhole end of the plug, the sleeve being movably arranged within a base pipe between a first position, where one or more ports defined in the base pipe are blocked, and a second position, where the one or more ports are exposed and provide fluid communication between an interior of the base pipe and a pressure chamber positioned outside of the base pipe, the sleeve having a first portion engaging a base pipe and a second portion engaging the first portion, and where the engaging member has an outer diameter that is less than an inner diameter of the first portion;

pressurizing the interior of the base pipe up hole of the plug to overcome a first shearing resistance between the first portion and the base pipe, thereby moving the sleeve to the second position;

preventing down hole movement of the first portion beyond the second position by engaging the first portion with a stop member positioned in the interior, the stop member being sized to prevent down hole movement of the first portion beyond the stop member;

pressurizing the pressure chamber via the one or more ports to activate the down hole tool; and

increasing a pressure of the base pipe to overcome a second shearing resistance between the first and second portions, thereby moving the second portion and the plug in a down hole direction away from the first portion, wherein the stop member is further sized to permit down hole movement of the second portion and the plug beyond the stop member.

10. The method of claim 9, wherein pressurizing the interior of the base pipe up hole of the plug comprises pressurizing the interior to a first value, and wherein pressurizing the pressure chamber via the one or more ports comprises pressurizing the interior to a second value that is greater than the first value.

11. The method of claim 10, wherein increasing a pressure of the base pipe comprises pressurizing the interior of the base pipe to a third value that is greater than the second value.

12. The method of claim 9, wherein landing the plug on the double shearing sleeve comprises engaging an engaging member of the plug with the second portion of the sleeve.

13. The method of claim 9, wherein pressurizing the pressure chamber via the one or more ports further comprises:

- moving a piston that is in communication with the pressure chamber; and
- expanding annular casing packer with the piston.

14. The method of claim 9, wherein overcoming the first shearing resistance includes overcoming a first shear assembly between the base pipe and the first portion.