properly interact with the latch assembly. In such situations, numerous additional trips into the well may be required to perform remedial action including, for example, installation of a new position reference device that is suspending within the casing via a packer assembly.

[0006] Accordingly, a need has arisen for improved system for constructing an exit for a multilateral well that does not require numerous additional trips into the well in the event of a latch coupling failure. In addition, a need has arisen for such an improved system that does not require remedial action to be performed in the event of a latch coupling failure. Further, a need has arisen for such an improved system that does not require installation of a new position reference device in the casing string in the event of a latch coupling failure.

SUMMARY OF THE INVENTION

[0007] Embodiments of t~~T~~he present invention are~~disclosed herein is~~ directed to a redundant position reference system for multilateral exit construction. In the event of a latch coupling failure, the redundant position reference system as per embodiments of the present invention does not require numerous additional trips into the well to perform remedial action or the installation of a new position reference device in the casing string.

[0008] ~~In one aspect, the present invention is directed to a position reference system for multilateral exit construction in a wellbore. The system includes a casing string positioned in the wellbore. A window joint is interconnected in the casing string. A first latch coupling is interconnected in the casing string downhole of the window joint. A second latch coupling is interconnected in the casing string downhole of the first latch coupling. The first latch coupling has a first inner profile operably engagable with a mating profile of a first latch assembly to anchor and orient the first latch assembly relative to the window joint. The second latch coupling has a second inner profile that is different from the first inner profile. The second inner profile is operably engagable with a mating profile of a second latch assembly to anchor and orient the second latch assembly relative to the window joint.~~ According to a first aspect, there is provided a redundant position reference system for multilateral exit construction in a wellbore, the system comprising: a casing string positioned in the wellbore; a window joint interconnected in the casing string; a first latch coupling interconnected in the casing string downhole of the window joint, the first latch coupling having a first inner profile; a first whipstock assembly operable to be run in the casing string, the first whipstock assembly including a first latch assembly having a first mating profile operably engagable with the first inner profile to anchor and orient the first latch assembly within the first latch coupling and to axially locate and circumferentially orient a first deflector surface of the first whipstock assembly within the window joint; a second latch coupling interconnected in the casing string downhole of the first latch coupling, the second latch coupling having a second inner profile that is different from the first inner

profile; and a second whipstock assembly operable to be run in the casing string, the second whipstock assembly including a second latch assembly having a second mating profile operable to pass through the first inner profile and operably engagable with the second inner profile to anchor and orient the second latch assembly within the second latch coupling and to axially locate and circumferentially orient a second deflector surface of the second whipstock assembly within the window joint, thereby providing redundant access to the window joint.

[0009] In one embodiment, the first latch coupling is positioned proximate the window joint in the casing string. In another embodiment, the second latch coupling is positioned proximate the first latch coupling in the casing string. In certain embodiments, the first inner profile of the first latch coupling may include one or more of a plurality of axially spaced apart recessed grooves, a plurality of circumferentially extending recessed grooves, a plurality of circumferentially extending recessed grooves that extend about the entire circumference of the first latch coupling, at least one preferential circumferential alignment element and a plurality of preferential circumferential alignment elements. Likewise, the

second inner profile of the second latch coupling may include one or more of a plurality of axially spaced apart recessed grooves, a plurality of circumferentially extending recessed grooves, a plurality of circumferentially extending recessed grooves that extend about the entire circumference of the second latch coupling, at least one preferential circumferential alignment element and a plurality of preferential circumferential alignment elements.

[0010] ~~In another aspect, the present invention is directed to a position reference method for multilateral exit construction in a wellbore. The method includes positioning a casing string in the wellbore, the casing string including a window joint, a first latch coupling downhole of the window joint and a second latch coupling downhole of the first latch coupling, the first latch coupling having a first inner profile that is different from a second inner profile of the second latch coupling; running a whipstock assembly having a deflector surface and a latch assembly into the casing string; and operatively engaging an outer profile of the latch assembly with the first inner profile, thereby anchoring the whipstock assembly and orienting the deflector surface relative to the window joint.~~According to a second aspect, there is provided a redundant position reference method for multilateral exit construction in a wellbore, the method comprising: positioning a casing string in the wellbore, the casing string including a window joint, a first latch coupling downhole of the window joint and a second latch coupling downhole of the first latch coupling, the first latch coupling having a first inner profile, the second latch coupling having a second inner profile that is different from the first inner profile; running a first whipstock assembly having a first latch assembly into the casing string, the first latch assembly having a first mating profile operably engagable with the first inner profile such that operable engagement of the first mating profile with the first inner profile anchors and orients the first latch assembly within the first latch coupling to axially locate and circumferentially orient a first deflector surface of the first whipstock assembly within the window joint; failing to operatively engage the first mating profile of the first latch assembly with the first inner profile of the first latch coupling; retrieving the first whipstock assembly to the surface; running a second whipstock assembly having a second latch assembly into the casing string, the second latch assembly having a second mating profile operably engagable with the second inner profile; passing the second latch assembly through the first latch coupling; and operatively engaging the second mating profile of the second latch assembly with the inner profile of the second latch coupling, to anchor and orient the second latch assembly within the second latch coupling and to axially locate and circumferentially orient a second deflector surface of the second whipstock assembly within the window joint, thereby providing redundant access to the window joint.

[0011] The method may also include operatively engaging a plurality of keys with a plurality of axially spaced apart, circumferentially extending recessed grooves and operatively

engaging the plurality of keys with a plurality of preferential circumferential alignment elements.

[0012] Disclosed herein is~~In a further aspect, the present invention is directed to~~ a position reference method for multilateral exit construction in a wellbore. The method includes positioning a casing string in the wellbore, the casing string including a window joint, a first latch coupling downhole of the window joint and a second latch coupling downhole of the first latch coupling; running a first whipstock assembly having a first latch assembly into the casing string; failing to operatively engage an outer profile of the first latch assembly with an inner profile of the first latch coupling; retrieving the first whipstock assembly to the surface; running a second whipstock assembly having a second latch assembly into the casing string; passing the second latch assembly through the first latch coupling; and operatively engaging an outer profile of the second latch assembly with an inner profile of the second latch coupling, thereby anchoring and orienting the second whipstock assembly relative to the window joint.

[0013] The method may also include operatively engaging a plurality of keys with a plurality of axially spaced apart, circumferentially extending recessed grooves, operatively engaging the plurality of keys with a plurality of preferential circumferential alignment elements and spacing out the second whipstock assembly with an extension joint.