CLAIMS

1. A clamp assembly device for connecting a rotating control device bearing assembly to a main body of a rotating control device, the clamp assembly device comprising:

a) a set of clamp members configured to retain the bearing assembly in place on the main body;

b) a clamp actuator for driving clamping and unclamping of the clamp members; and

c) a lock pin controlled by a lock pin actuator, the lock pin actuator configured to lock and unlock the clamp assembly device by moving the lock pin between locked and unlocked positions along an axis substantially parallel with ~~the~~an axis of rotation of the bearing assembly;~~.~~

wherein the clamp actuator is a clamping hydraulic cylinder acting to move the clamp members together to a clamped position and to move the clamp members apart to an open position;

wherein the lock pin actuator is a locking hydraulic cylinder associated with a first clamp member of the clamp members, wherein the clamp members have generally aligned bores, and the locking cylinder is configured to move the lock pin into and out of the generally aligned bores.

~~2. The device of claim 1, wherein the clamp actuator is a clamping hydraulic cylinder acting to move the clamp members together to a clamped position and to move the clamp members apart to an open position.~~

~~3.~~2. The clamp assembly device of claim ~~2~~1, wherein the clamping hydraulic cylinder is connected between a pair of extensions extending from adjacent ends of the clamping members.

~~4.~~3. The clamp assembly device of claim ~~3~~2, wherein extending of the clamping hydraulic cylinder acts to move the clamp members together to the clamped position and retracting of the clamping hydraulic cylinder acts to move the clamp members apart to an open position.

~~5.~~4. The clamp assembly device of claim ~~3 or 4~~2, wherein a hinge is connected between the adjacent ends of the clamping members medial to the clamping hydraulic cylinder.

~~6.~~5. The clamp assembly device of claim ~~5~~4, wherein the hinge is connected between the main body and the first and second clamping members, thereby holding the device in place when in the open position.

~~7. The device of any one of claims 2 to 6, wherein the lock pin actuator is a locking hydraulic cylinder associated with a first clamp member of the clamp members, the locking hydraulic cylinder configured to move the lock pin into and out of generally aligned bores of the clamp members.~~

~~8.~~6. The clamp assembly device of claim ~~7~~1, wherein mov~~ing~~ement of the lock pin into the generally aligned bores provides the locked position and moving the lock pin out of the generally aligned bores provides the unlocked position.

~~9.~~7. The clamp assembly device of claim ~~7 or 8~~1, wherein the locking hydraulic cylinder is connected to a lug on the first clamp member and a second clamp member of the clamp members ~~provides~~includes an arm configured to enter a channel of the lug to align a pair of lug bores with a bore of the arm, wherein, when the clamp members are in the clamped position, the bore of the arm and the pair of lug bores provide the generally aligned bores.

~~10.~~8. The clamp assembly device of ~~any one of~~ claim~~s~~ 1 ~~to 9~~, wherein the clamp actuator and the lock pin actuator are spaced apart from each other.

~~11.~~9. The clamp assembly device of claim ~~10~~8, wherein the clamp actuator and the lock pin actuator are located on substantially opposing sides of the device.

~~12.~~10. The clamp assembly device of ~~any one of~~ claim~~s 9 to 11~~7, wherein the locking hydraulic cylinder is connected to the lug by a lock pin housing, the lock pin housing having a housing bore aligned with the pair of lug bores.

~~13.~~11. The clamp assembly device of ~~any one of~~ claim~~s 9 to 12~~7, wherein the lock pin has a tapered surface which engages with a complementary tapered surface of a wear insert in the bore of the arm to drive the arm to further align the generally aligned lock bores to provide mechanical locking of the device.

~~14.~~12. The clamp assembly device of ~~any one of~~ claim~~s 9 to 13~~7, wherein a sidewall of an upper bore of the pair of lug bores ~~is provided with~~includes an upper wear insert.

~~15.~~13. The clamp assembly device of ~~any one of~~ claim~~s 12 to 14~~10, wherein the housing bore is circular and provided with a housing wear insert which is rotatable within the housing bore, the housing wear insert having a non-circular shaped lock pin bore formed therein which, when rotated from a normal position, prevents entry of the lock pin into the non-circular shaped lock pin bore from above the housing wear insert.

~~16.~~14. The clamp assembly device of claim ~~15~~13, wherein the lock pin housing has a lateral slot and the housing wear insert has a secondary lock member connected thereto and extending outward from the lateral slot to provide a mechanism for rotating the housing wear insert when the lock pin is extended upward outside of the housing wear insert, thereby moving the non-circular shaped lock pin bore out of alignment with the first and second locking member bores, thereby preventing the lock pin from dropping into the non-circular shaped lock pin bore and providing a secondary lock mechanism.

~~17.~~15. The clamp assembly device of claim ~~16~~14, wherein the ends of the lateral slot each have an enlarged radius to prevent the secondary lock member from sliding in the slot when the secondary lock member drops into a lower portion of the enlarged radius.

~~18.~~16. The clamp assembly device of ~~any one of~~ claim~~s 15 to 17~~13, wherein the non-circular shaped lock pin bore is deviated from the center of the housing wear insert to provide different distances between the center of the locking bore and each of the sides of the locking bore, thereby providing an adjustment mechanism to overcome minor deformations of the sides of the locking bore or minor deformations of the lock pin, the

adjustment mechanism controlled by removing, reorienting and replacing the housing wear insert.

~~19.~~17. The clamp assembly device of ~~any one of~~ claim~~s~~ 1 ~~to 18~~, further comprising a lock pin position sensor configured to provide a visual indicator to an operator when the locking actuator is in the locked position.

~~20. The device of any one of claims 1 to 19, wherein the locking actuator is removable, thereby allowing replacement of the lock pin.~~

~~21.~~18. The clamp assembly device of claim 1 ~~or 2~~, wherein the clamp~~ing~~ actuator and the lock pin actuator are located substantially on the same side of the clamping assembly ~~as the locking hydraulic cylinder~~ and a hinge is located between two ends of the clamp members substantially on the opposite side of the device.

~~22. A hydraulic system for controlling the sequence of clamping, locking, unlocking and unclamping of the device of any one of claims 1 to 21, the system comprising: a hydraulic network having first and second ports, the hydraulic network configured to pump hydraulic fluid into the network via the first port and direct the hydraulic fluid first to the clamping actuator to clamp the clamping members together and then to direct the hydraulic fluid to the locking actuator to lock the clamping members together, the hydraulic network further configured to pump hydraulic fluid into the network via the second port and direct the hydraulic fluid first to the locking actuator to unlock the clamping members and then to the clamping actuator to unclamp the clamping members.~~

~~23. The system of claim 22, wherein the direction of movement of the hydraulic fluid is controlled by one or more sequence valves within the hydraulic network.~~

~~24. The system according to claim 23, wherein the one or more sequence valves comprise an unclamping sequence valve in the channel providing hydraulic fluid to the clamping actuator when the clamping members are being unclamped.~~

~~25. The system according to claim 23 or 24, wherein the one or more sequence valves comprise a locking sequence valve in the channel providing hydraulic fluid to the locking hydraulic cylinder when clamping members are being locked.~~

~~26. The system according to any one of claims 23 to 25, wherein the sequence valves are arranged in parallel with each sequence valve having a bypass check valve for reverse flow.~~

~~27. The system according to any one of claims 22 to 26, wherein the hydraulic network comprises a clamping one-way valve to maintain clamping pressure on the clamping actuator.~~

~~28. The system according to claim 27, wherein the clamping one-way valve is a pilot controlled one-way valve configured to allow counter-flow in response to pressure being applied to unclamp the clamping members.~~

~~29. The system according to any one of claims 22 to 28, wherein the hydraulic network comprises a locking one-way valve to maintain locking pressure on the locking actuator.~~

~~30. The system according to claim 29, wherein the locking one-way valve is a pilot controlled one-way valve configured to allow counter-flow in response to pressure being applied to unlock the clamping members.~~