Service Kit 753-05611

Date: March 18, 2009 (Revised - 6/08/2009)

Subject: Hydraulic Cylinder Seal Replacement

Models Affected: XINGHUI 2.5" Cylinder 718-04241

Read through and understand these instructions completely before proceeding with repair.

NOTE: *These materials are prepared for use by trained technicians who are experienced in the service and repair of equipment of the kind described in this publication, and are not intended for use by untrained or inexperienced individuals. Such individuals should seek the assistance of an authorized service technician or dealer.*

NOTE: ***Save this Instruction Sheet. Refer to it when ordering replacement parts.***

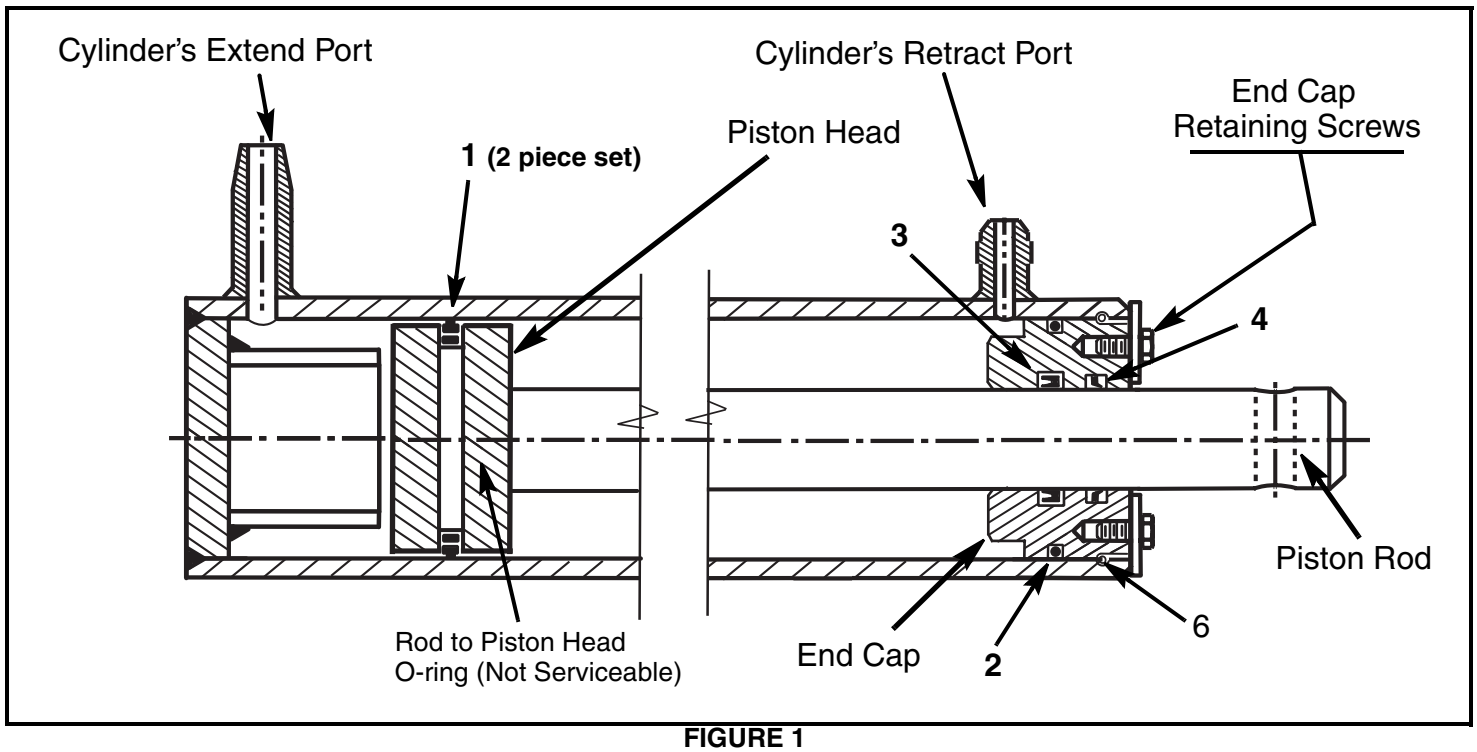

FIGURE 1

Service Kit Contents

(See Figure 1)

ITEM NO.	PART NUMBER	QTY	DESCRIPTION
1	*	1	Piston Seal: 2 piece set (Outer ring w/ flat under ring)
2	*	1	O-ring
3	*	1	End Cap U-Cup
4	*	1	Wiper: Rod
5	726-0299	1	Cap: Push: 1/2" Dia. (Not Shown)
6	*	1	Ring: Retaining
7	*	1	THIS INSTRUCTION SHEET

* - Not Available Separately

Regarding The Following Instructions...

Cylinder seal replacement may be accomplished with either the cylinder removed from the log splitter beam and set in a bench vise or remain secured to the log splitter beam.

The following instructions are written assuming the later method. This method provides several advantages:
a) only the retract port hose needs to be removed
b) minimizes potential damage to control valve
c) no lifting/carrying of the heavy cylinder assembly

Disadvantage:
a) tank assembly (beam) and area surrounding rod end must be cleaned to ensure no dirt or debris gets into the open cylinder or on the piston head/rod assembly.

CAUTION Hot hydraulic fluid can cause burns. Do not work on the cylinder until the hydraulic system has cooled to ambient temperature after use.

DANGER Hydraulic fluid under high pressure can be dangerous. A high-pressure hydraulic fluid leak or spray can penetrate the skin. If this happens, seek immediate medical attention to reduce the risk of blood poisoning leading to death or limb amputation.

DANGER If a piece of hydraulic equipment develops a high pressure leak, turn it off immediately. Do not operate it until the leak is repaired.

For your safety and eye protection wear safety glasses during the following repair.

IMPORTANT!- The cylinder must be disassembled in a clean environment to prevent dirt or other contamination from entering the interior of the cylinder. Prior to proceeding, clean any accumulated dirt or debris from the port openings, end cap areas and the beam around the rod end of the cylinder.

RECOMMENDED TOOLS:
Safety glasses, wheel blocks, bench vise with brass or rubber jaw covers, soft metal or wood punch, hammer, metric wrenches and sockets w/ ratchet, 9/16" ID plastic tubing, adjustable hose clamp for plastic tubing, 5 gal. clean plastic pail, clean hydraulic oil, clean paper towels or shop towels, and 2 flat blade screw drivers (one thin blade and one large blade).

Pre-Service Preparation:

1. Place the log splitter on a flat and level surface.

2. Block the wheels at the front and rear to prevent the log splitter from rolling during cylinder repair.

3. Secure the cylinder in the cradle frame and lock bracket as follows: Pull the locking pin out from the cradle frame (A). Using the handle at the control valve (B), slide the cylinder back until the trunnions on the cylinder set into the cradle. Ensure that the cylinder lock bracket secures the cylinder in the cradle. Reinstall the locking pin into the cradle frame (C). See Figure 2.

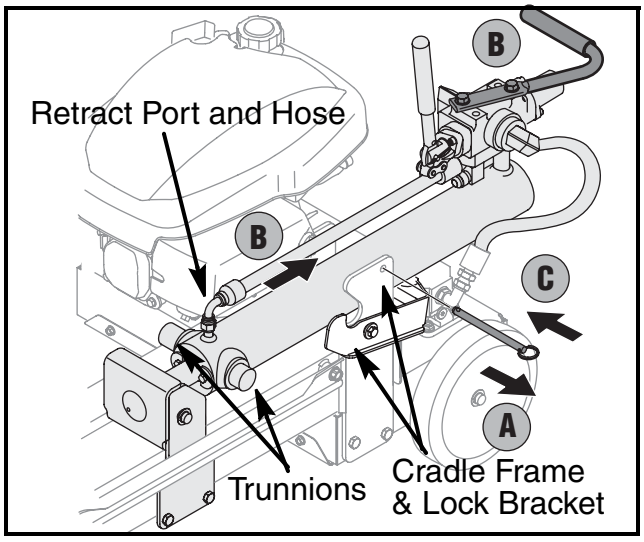

FIGURE 2

4. If the piston rod is in the extended position, and the log splitter **can** be safely run, start the engine and RETRACT the piston rod fully. Shut down the engine. Proceed to Step 12.

If the piston rod is in the extended position and the log splitter **can not** be safely started, proceed to Step 5.

5. Remove the spark plug wire from the spark plug and ground wire to the engine block. Ensure that the cylinder trunnions are locked into the cradle frame and lock bracket. Refer to Step 3 and Figures 2 and 4.

6. Using an adjustable wrench, remove the J.I.C. flare nut from the cylinder's RETRACT port. Cap the end of the 3/8" hydraulic tube with a 9/16"-18 J.I.C. (37^0 Flare) male plug or plastic cap or plug. See Figure 2.

7. Loosen the hose clamp and remove the return-to-tank hose at the directional control valve. See Figure 3. Place a plug into the end of the hose to keep hydraulic fluid from draining from the tank.

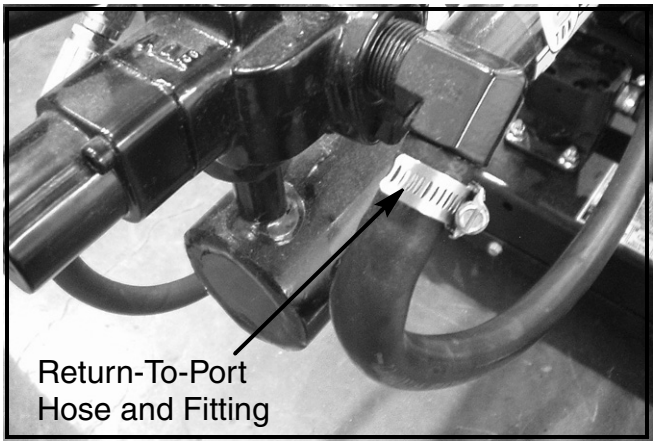

FIGURE 3

8. Place a clean 5 gal bucket under the valve's return-to-port fitting to collect the cylinder's fluid in the next step.

9. Set the directional control valve to the RETRACT position. (i.e. opens cylinder EXTEND port to tank)

10. Slowly and steadily push on the push bracket assembly/piston rod until the piston rod bottoms out to force the fluid from the cylinder.

NOTE: It may be difficult to push the piston rod in due to seal friction. Use the appropriate mechanical assistance, i.e. ratchet strap or jack, to assist.

11. Reconnect the valve's return-to-port hose onto the return-to-port fitting and secure with the hose clamp. Perform Steps 15 and 16 then proceed to **"Piston Assembly Removal".**

12. Cycle the directional control valve to the extend and retract positions several times to relieve any pressure remaining in the cylinder and hoses.

13. Allow engine, muffler and hydraulic cylinder to cool before proceeding.

14. Remove the spark plug wire from the spark plug and ground to the engine block.

Piston Head/Rod Assembly Removal:

15. Using a large flat blade screw driver, pry off and discard a push cap on one end of the pivot rod securing the cylinder's piston rod to the push bracket assembly. Remove the pivot rod and spacers. See Figure 4.

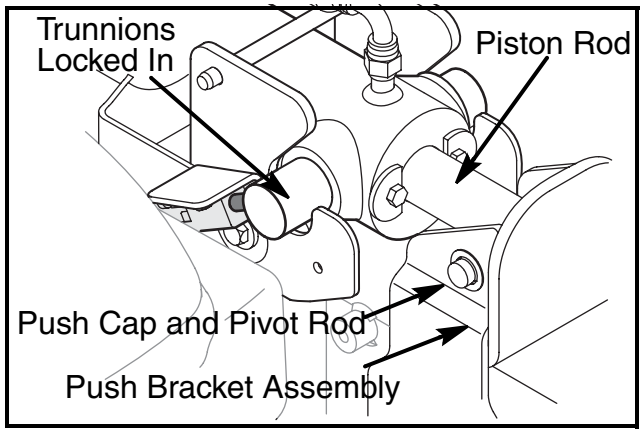

FIGURE 4

16. Slide the push bracket assembly away from the cylinder as far as it will go.

17. Using an adjustable wrench, remove the J.I.C. flare nut from the cylinder's RETRACT port. Cap the end of the 3/8" hydraulic tube with a 9/16"-18 J.I.C. (37^0 Flare) male plug or plastic cap or plug.

18. Install a length of 9/16" ID clear plastic tubing (or equivalent) onto the fitting at the cylinder's RETRACT port. Secure the tubing to the fitting using an adjustable hose clamp. Do not over tighten so as not to cut through the hose or damage the fitting threads. Place the opposite end of the plastic tubing into the a clean 5 gallon plastic bucket and secure it so that it does not fall out of the bucket.

19. Insert a 1/2" diameter x 12"-15" long steel bar, or other suitable rod, through the hole in the piston rod end.

20. Place the directional control lever in the RETRACT position.

21. **Slowly** pull the cylinder's piston rod out, displacing the oil out through the clear plastic hose and into the plastic bucket. Continue to slowly pull the piston rod out until the piston bottoms out on the cylinder's end cap.

22. Once the oil has stopped flowing from the cylinder, remove the plastic tube from the plastic bucket and from the cylinder's RETRACT port.

Piston Assembly Removal:

NOTE: *There will be some oil remaining in the cylinder. Place sufficient paper towels or shop towels under the rod end of the cylinder to absorb the residual oil when the end cap is removed.*

23. Remove the two (2) end cap retaining cap screws and washers that are installed on the face of the end cap. See Figure 1.

24. Using a flat punch (aluminum, brass or wood dowel), gently tap on the end of the punch with a hammer to drive the end cap back into the cylinder bore until the face of the end cap is past the retaining ring. Alternate sides when tapping on the end cap to drive the end cap back evenly. See Figure 5.

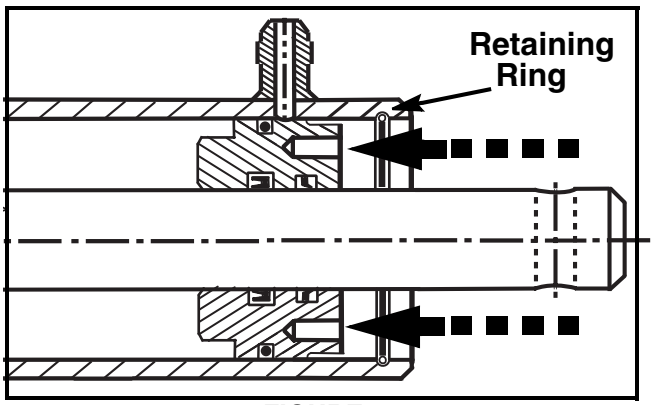

FIGURE 5

25. Using your fingers, or a thin flat blade screwdriver, remove the retaining ring from the groove in the cylinder wall. Keep the retaining ring for reassembly later. Be very careful not to scratch any part of the cylinder bore which may damage the piston seals upon reassembly.

NOTE: *Using a soft (fine grit) emery cloth, remove any paint from the from retaining ring groove to outside edge of the cylinder.*

IMPORTANT - In the next step be careful when removing the piston assembly and end cap as they may separate from the cylinder barrel quickly. Be ready to support the weight of the assembly. Be careful not to mar the chromed surface of the rod.

NOTE: *The piston head seal and end cap static seal will likely be cut by the edge of the retaining ring groove on removal from the barrel. This result is normal and difficult to avoid.*

26. While keeping the rod centered and parallel with the cylinder, pull the rod out vigorously and allow the piston head to bump the end cap. Continue to pull the piston assembly out of the cylinder bore.

NOTE: It may be difficult to pull the piston rod out due to seal friction. Use an appropriate mechanical assistance, i.e. ratchet strap or jack, to assist.

CAUTION: NEVER use compressed air to blow the piston assembly out from the cylinder.

27. Secure the rod so that the end cap can be removed. If securing the rod in a vise, use clean cardboard or a thick dense rubber sheet to pad the vise jaws.

BE CAREFUL not to scratch or mar the rod chromed surface, it cannot be repaired if dented or scratched.

Seal Replacement:

IMPORTANT - Make note (sketch) of the position and orientation of the seals on the piston head and on the end cap before removing them to assist in replacement. It is very important that the two small seals on the inside bore of the end cap are set into their respective grooves in the same orientation as the old seals are.

28. The seals may be removed with a sharp tool like an awl (brass awls are preferred) by carefully pushing the point partially into the seal and prying the seal from the groove. Hard seals can be removed by carefully cutting the seal with an exacto type blade being careful not to scratch the groove walls or adjacent surfaces. Discard the old seals.

29. Inspect the seal grooves and clean away any contamination. Apply a light coating of clean oil to the new seals and into the seal grooves to ease installation and prevent scuffing of the sealing surfaces.

Optional - A plain petroleum jelly may be used in lieu of or in combination with the clean oil.

30. Install the new seals into the appropriate seal grooves and in the correct orientation on the piston head and on the end cap.

31.Coat the internal end cap seals and chromed end of the rod with additional oil and/or petroleum jelly.

32. Carefully assemble the end cap onto the rod by gently pushing it over the end of the rod.

33. Apply a light coating of clean oil to the piston head and end cap outer diameters, and to the mouth of the cylinder barrel.

34. Carefully position the piston head so that it is centered and square with the cylinder wall mouth.

35. Once started, push firmly until the piston is about half way down the length of the cylinder bore.

NOTE: *Be careful not to mar the chromed rod surface in the next step.*

36. Carefully push the end cap into the cylinder bore until the front face is past the retaining ring groove. The end cap may have to be gently driven down into the cylinder bore using a hammer and a soft metal or wood dowel.

37. Install the new end cap Retaining Ring, Item 6, into the groove. Ensure that the ring is completely nested into the bottom of the groove.

38. Pull the rod outward until the piston head contacts the end cap. Continue to pull on the rod until the end cap is firmly in position against the retaining ring.

39. Install the end cap retaining cap screws and washers. ***The retaining ring must be captured between the washer and the end cap to insure proper operation.***

NOTE: *Check the cylinder's retract port fitting and the hydraulic hose's flare to ensure that there are no nicks, scratches or debris on the fitting's coned/tapered surfaces that can cause leaks under pressure.*

40. Reconnect the hydraulic hose, removed in Step 6/17, to the cylinder's RETRACT port fitting. Tighten securely.

41. Using the new Push Cap, Item 5, re-install the push bracket assembly onto the piston rod with the 1/2" pivot rod and spacers removed in Step 15. Ensure that the push cap is securely set on the 1/2" pivot rod.

Priming the Pump and Purging the System:

42. Check the level of the hydraulic oil in the log splitter reservoir tank. Maintain fluid level to just below the oil plug hole. If low, add the appropriate hydraulic oil (see the Operator's Manual) to bring the level up to just below the oil plug hole. Replace the plug and tighten when finished.

43. Ensure that the cylinder trunnions are secured in the cradle and the lock bracket and the locking pin is in place in the frame securing the cylinder.

44. Ensure that the push bracket assembly's path is clean of debris and the beam surface is well lubricated with engine oil during the following cycling.

45. Place the Directional Control Valve into the NEUTRAL position.

46. Reconnect the spark plug wire to the spark plug.

47. Start the log splitter engine.

48. Move the Directional Control Valve to the RETRACT position. Allow the piston rod to fully retract into the cylinder. Check for fluid leaks around the piston rod and end cap.

49. Move the Directional Control Valve to the EXTEND position. Allow the piston rod to fully extend until it stops. Allow pressure to set there for less than 2 seconds, then release. Check for fluid leaks around the cylinder's EXTEND port fitting.

50. Move the Directional Control Valve to the RETRACT position. Allow the piston rod to fully retract. Turn off the engine and cycle the control valve to the extend and retract positions several times to relieve any pressure in the cylinder and hoses.

51. Check the level of the hydraulic oil in the tank. If low add the appropriate hydraulic oil (see the Operator's Manual) to bring the level up just below the oil plug hole. Replace and tighten the plug.

52. Repeat the full RETRACT and EXTEND cycle sequence at least an additional five (5) times to purge air from the hydraulic lines and cylinder.

NOTE: *Air in the hydraulic lines and/or will cause an erratic stroke and or slow response. Additional cycling will be needed to remove the air from the system.*

53. Ensure that the Directional Control Valve when in the RETRACT position automatically kicks off (to NEUTRAL) effectively and consistently at the end of the retract stroke.

54. Check for leaks. Correct as necessary. If no leaks are found, remove any blocking used.

This completes the installation of the hydraulic seal kit.

NOTES