

Leyland Position Control Hydraulics - "Cycling"

First we need to look at how the hydraulics work.

When you move the main lever to lift, in either Draught or Position control, the main spool valve moves downward to uncover a port. There's a small valve, called the 'Unloader Valve', situated in the centre of the valve chest. Low pressure oil plus a small spring acting on the top of this valve holds it in the 'Down' position preventing oil entering the lift cylinder. When the main spool has uncovered the port oil is directed to the underside of the Unloader Valve forcing it upward to the 'Lift' position, this movement uncovers another port, oil then enters the lift cylinder via the external filter and non return valve. As the hydraulics lift, the cross shaft rotates and lifts the lift arms. An internal cam fixed to the cross shaft and acting on the main spool valve via a 'Three Legged lever' rotates and moves the main spool valve upwards to the neutral position. (Dictated by where the main control lever is positioned) When neutral is reached the Unloader Valve moves back down preventing further oil entering the cylinder, thus maintaining the set 'Height'. When you move the control lever to lower the Three Legged Lever moves the main spool valve further upwards to the 'Lower' position, the spool valve uncovers a port and allows oil to flow via a 'Drop Limiting Valve' back to the transmission.

After this lengthy description down to the 'Cycling' problem! When the implement is held at a given height the oil in the cylinder is 'Held' back by the lift cylinder piston rings, the check valve in the external filter and the various 'Lands' on the spool valve. If any of these areas 'Leak' oil then the linkage will drop slightly causing the cross shaft and internal cam to rotate. As they rotate the Three Legged Lever will move the main spool valve back to lift! this action is called 'Cycling' and will bring the linkage and implement back up to its preset height.

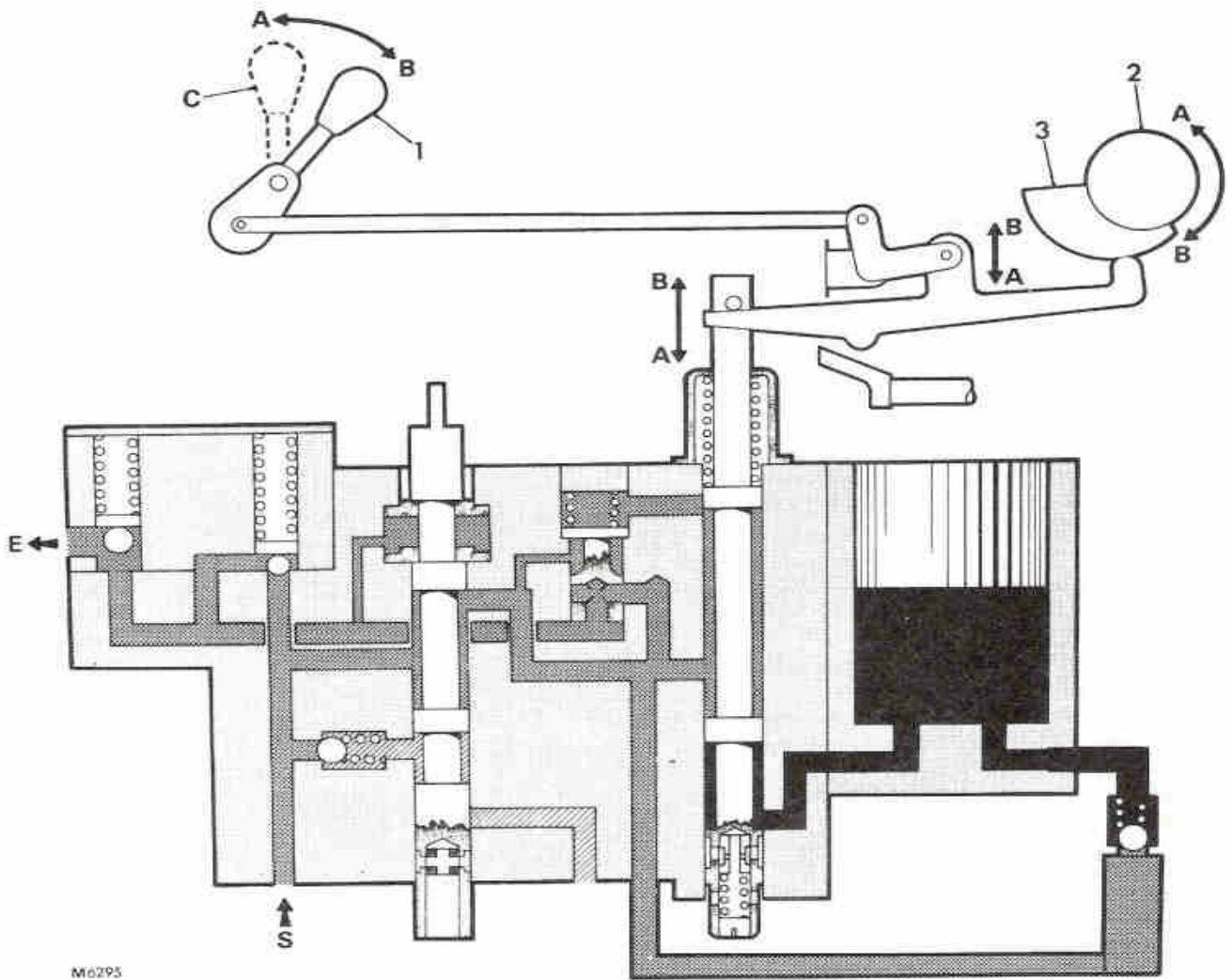
This cycling is perfectly normal, but if there is excess leakage it can become excessive and cause the problem described. A hydraulic system in new condition shouldn't cycle any faster than once every 6 seconds or so with a heavy implement mounted on the back. The land at the bottom of the spool valve is the normal culprit for this leakage since it is subjected to very fast flowing oil under high pressure, this, particularly if the filters aren't changed regularly, will erode metal off the Spool Valve 'Land' and over time the problem is increased to an unacceptable level.

Although the valve chest can be exchanged for a 2nd hand one it is probably as bad as the one taken off! There was never an exchange scheme and spool valves could not be obtained separately. Unfortunately there is very little that can be done to overcome the problem. (If a new valve chest can be found it will be very expensive)

When the implement is raised, and the engine is stopped, does the implement lower to the ground very quickly? If so there may be some internal leakage caused by a leaking 'O' ring, split pipe or loose pipe connection. The 'O' ring fitted between the valve chest and lift cylinder is a special one with a thicker than normal cross section to cater for the three shims that must be present between the valve chest and lift cylinder, if the old one is replaced or the wrong one fitted it can 'Blow' out causing excessive cycling. Thin or very old transmission oil will also give the problem described.

In the '**INFORMATION**' section of the club web site:- "The Nuffield and Leyland Tractor Club" you will find a load of diagnostic/adjustment information that may help you. Also has the hydraulic control linkage been adjusted? It is very important that this is carried out exactly to the instructions given.

Remember the last Leyland Tractor was built in 1982 and the last Marshall in 1986!



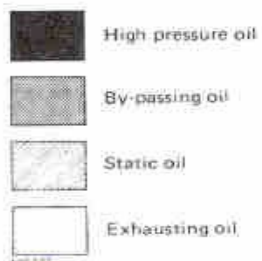
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FLOW DIAGRAM – POSITION CONTROL

A. Lift
 B. Lower
 C. Full lift position

E. Exhaust
 S. Supply

1. Hand lever
 2. Cross-shaft
 3. Position-control cam



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