

Commonality and Postponed Differentiation
for

Loader/Backhoe Swing Valves

CASE Corporation
PRODUCT OFFERING GROUP

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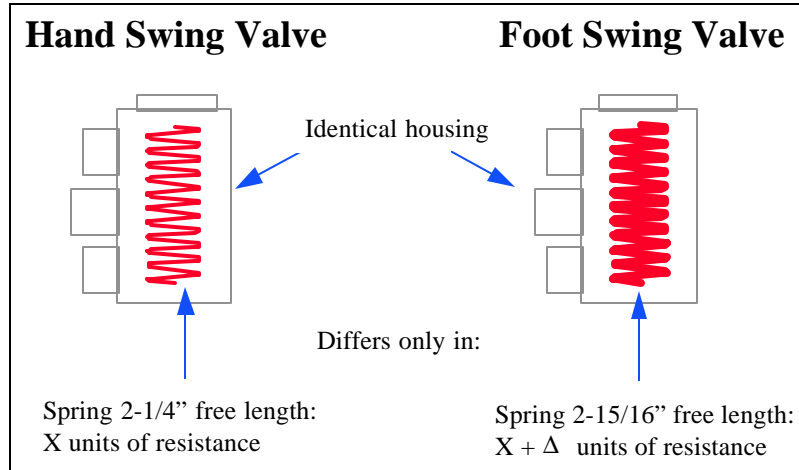
by

Hernan Moraga

(with the collaboration of Rich Lech, Dennis Brock, and Anne Fancher)

Executive Summary

Currently, the swing Backhoe control valve for foot swing (part No. 122854A2) differs from the hand swing unit (part No. 120046A2) only in one internal spring (parts No. 1986722C1 and 1994596C1, respectively.)

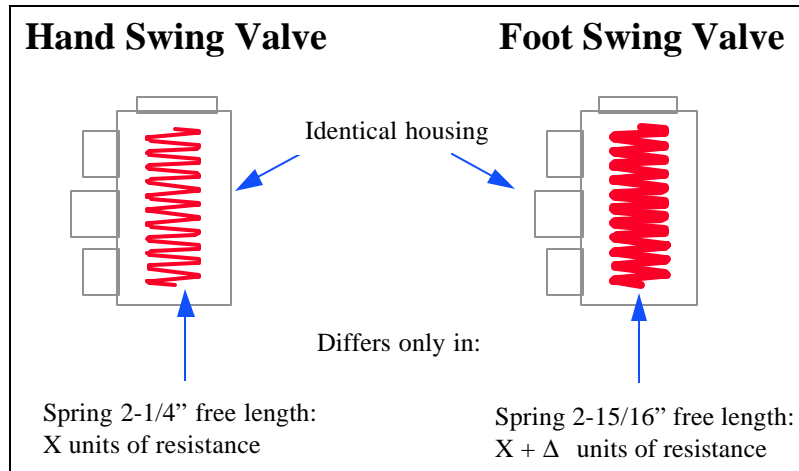


The complexity reduction proposition consists of modifying part of the CASE controls (i.e., mechanical control linkages) in a way that allows CASE to accomplish two objectives:

- Having eliminated parts No. 122854A2, and No. 1986722C1
- Introducing a new feature in the CASE Backhoe controls (i.e., User customizable swing knob)

Proposal: Modification of the CASE controls and Elimination of the Backhoe Foot Swing valve

Graphically speaking, the foot and hand swing differs only in the internal resistor element (spring), which requires the handling of two separate Backhoe control valves at the assembly line:



Two different resistive forces are required at the spool-swing section connection because pressures generated with the hand are considerably smaller than those generated with the foot.

Current Impact in the Field

When a machine requires switching from CAT to CASE controls, or vice-versa, the field engineer needs to perform the following sequence of operations:

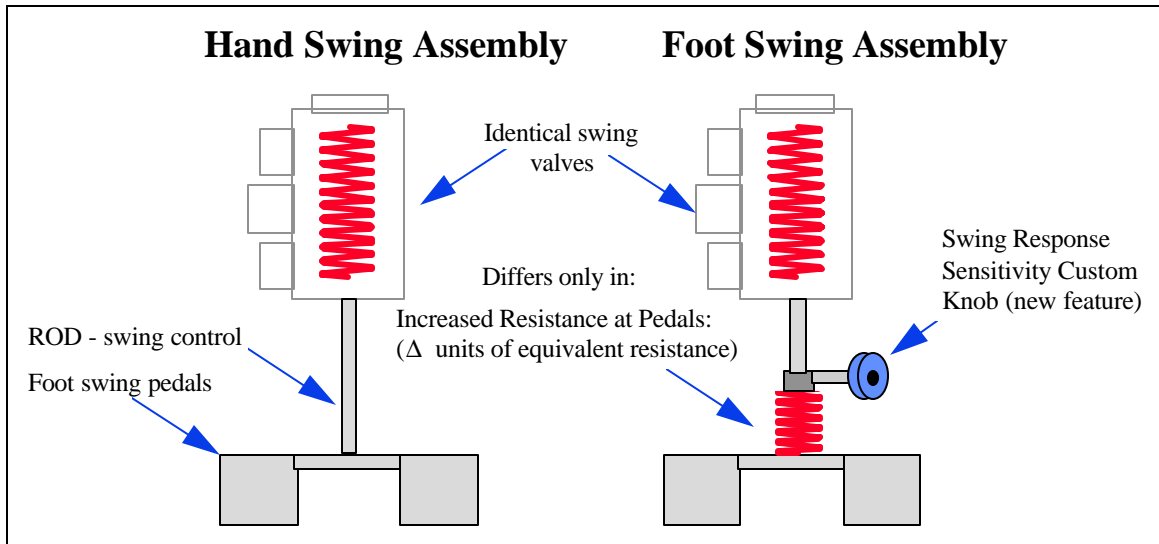
1. Dismount the fire wall housing
2. Disconnect and remove control linkages
3. Disconnect hydraulic hoses from valve bank
4. Remove valve bank
5. Disassemble valve bank
6. Replace the swing valve
7. Re assemble valve bank
8. Re mount valve bank in chassis
9. Re connect hydraulic hoses
10. Check for leakage
11. Mount the new control linkages
12. Re mount the fire wall housing

In total, **the machine would be down for a one or two day period, with the risk of a future fluid leakage.**

The Proposed Approach

The proposition consists of “translating” the Δ units of equivalent resistance from the interior of the valve to the foot swing pedals located in the Backhoe control subassembly. This would be accomplished by re-designing the PEDAL subassembly of the CASE Backhoe controls.

The following scheme illustrates the concept of translating the resistive equivalent Δ force provided today with the internal 2-15/16” free length spring:



The Field Impact

Under the proposed approach, when a machine requires switching from CAT to CASE controls, or vice-versa, the field engineer needs to perform the following sequence of operations:

1. Dismount the fire wall housing
2. Remove and disconnect control linkages
3. Mount the new control linkages
4. Re mount the fire wall housing

In total, **the machine would be down for a one or two HOUR period, with NO risk of a future fluid leakage.**

Conclusion

This postponed differentiation feature will bring several advantages both for CASE, its dealers, and finally, end-users:

Benefits for CASE:

- Simplified fabrication process at the hydraulic loader/Backhoe valves area
- Inventory reductions in Loader/Backhoe swing valves. Economies of scale
- Ability to start using the concept of "commonality" in our swing valves
- Ability to start using the concept of "postponed differentiation" in our cabs
- Reduced down time when a change of controls is required
- Source of re-launching CASE controls because of a new feature (i.e., Customizable Swing Knob)

Benefits for Dealers:

- Ability to respond QUICKLY to a customer preference for the preferred Backhoe controls

Benefits for End-Users:

- Reduced down time when a change of controls is required
- Ability to switch between CASE controls and CAT controls easily, and cheaper
- Increased customization potential

Potential cost implications:

The cost of the extra components required for modifying the CASE controls probably will be compensated with savings in the carrying costs associated with the foot swing valve. A further analysis is required to estimate the net financial effect of this situation.