



Technical Bulletin / Safety Alert

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(This document supersedes SMV TB0908/03)

Subject: Parkbrake Failed to Operate

Date: 28/9/08

Applicable to: All JUG-A-0 UL/UV "V1" & "V2" Machines.

Note: Minimum PPE required to carry out any inspections contained in this TBSA shall be protective clothing & footwear, safety glasses, hearing protection & any site specific requirements. A JSA or equivalent should be carried out prior to performing these tasks.

Occurance:

An operator detached an implement from the machine & drove back slightly then applied the parkbrake with the actuator on the dash above the steering wheel & noticed that the brake did not apply. He lifted the brake & attempted to apply the parkbrake again this time to find that it had applied.

He left the vehicle with the parkbrake applied & notified his supervisor. This was left on the shift report & the following dayshift contacted the operator to confirm the scenario & stood the machine down until the failure was investigated. The colliery made contact with VLI Diesel & a Technician was sent out to investigate the fault.

Investigation & Cause:

3 x VLI Diesel Technicians checked over the machines pneumatic & hydraulic braking circuits over a 3 day period to try to replicate the occurrence. Initially the machine was found to have some small pneumatic problems & hydraulic quick cycle problems. These were however not a contributing factor in the brake operation.

These problems were repaired & then inspections done on the actuation of the braking system. Though our Service Technicians could not replicate the faults in the field, in consultation with Mackay Fluidpower, who were doing testing in conjunction with us (see supporting documentation below) & from their test results, the decision was made to replace the dump valves with an alternate product that has a higher return spring value & shorter spool lands.

It is shown in the report below that in circumstances of high oil temperature when the pump is charging the system the standard valves may suffer a delay to actuate.

The alternate dump valves remove the extended delay time in the actuation of the parkbrake.

This incident has been reported to & investigated by the NSW DPI.

Recommendations:

Immediate Action:

Review the hydraulic circuit FMEA to ensure the modification has no adverse affect on the system.

Replace the current dump valves with the higher spring value valves nominated below.

Fit the filter bodies & cartridges as nominated below.

Future Action:

Carry out testing as nominated in the JUG-A-0 UL/UV service sheets.

Supporting Documentation:

See below for an excerpt from a report by Mackay Fluid power on the testing of the dump valves.

Dave, with regards to the recent occurrence of intermittent failure of Park Brakes application, we can offer the following information.

We have conclusive evidence supporting the theory that the cause of the Brakes not applying is due to the Spools failing to shift to the spring offset position when air is drained from the Pilot Chamber.

This occurrence, to the best of our knowledge, only takes place when simultaneously, two other factors are present. That is oil temp. is high and the Hydraulic pump is in the process of charging the Brake and Steering accumulators at the time of Park Brake application.

We also know the Pilot Chamber component in the valves is returning to the Home position when the Park Brake is applied, with the Spool frequently following up after a short delay, but in some instances failing to follow up until a considerable and unacceptable delay period.

This insight has allowed us to discuss the problem in detail with the Australian importer of the Park Brake valves. These discussions have led us to believe the problem is due to three factors. One is, the spring which returns Spool to its Normal position is of inadequate a force to return the spool. The second is the high oil inrush from the Brake Chambers these valves are exposed to, creates flow forces against the spool lands which oppose the spring. {Oil Temp. related}. And finally the Transition position of these valves results in a Momentary, All Ports Blocked function.

The immediate solution to this problem to date, has been replacing the valves with an Alternate Brand valve which has a higher spring value and narrower spool lands. To date there has been no reported reoccurrences of this problem on Machines with the alternative valves.

The Second and more cost effective solution is being provided by the Australian supplier of the original valve, which involves a Spring upgrade and Depending on some R&D may involve a spool modification to provide a Motoring transition; and in addition to these changes a flow control orifice may be fitted to the appropriate DCV port to control the Brake application rate and therefore the oil flow through the Brake vales.

Thanks and Regards

Terry Vanden Bergh | Project Coordinator

Conclusion:

It is our recommendation that the dump valves be replaced with the alternate valve that has shorter lands & a greater spring rate that has proven to be reliable in recent testing. The new dump valve part no. is 0301-10055. In conjunction with these it is recommended that a filter, body part no. 0305-10054 & cartridge part no. 0305-10055 is fitted between the dump valves & the logic block (see earlier VLI Diesel TBSA0008 re the fitting of these filters).

Please ensure this document is circulated to all relevant personnel within your organisation.

Should you have any further queries please contact your VLI Diesel Representative.

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