



Technical Bulletin / Safety Alert

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Rev: 0

(This document supersedes Juganaut Industries TBSA 0008)

Subject: Notification of Park Brake failing to apply.

Date: 07/04/08

Applicable to: All JUG-A-0 UL/UV 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 isolated incident occurred on a mine site in Queensland on Tuesday nightshift the 1st of April concerning a JUG-A-0 UL/UV. The Operator of the machine applied the Park Brake, exited the machine, then noticed that the Park Brake failed to apply and the machine rolled backwards.

The Operator then notified the shift fitter. The shift fitter then inspected the machine and was unable to replicate the fault on the machine.

On Wednesday the 2nd of April, a VLI Diesel service fitter inspected the machine and was able to replicate the fault. All of the pneumatic circuit was inspected to ensure it was all functioning correctly. The checks on the pneumatic circuit included checking the door interlock valve activation and that all air pressure to the pilot side of the Park Brake Dump valves was exhausting. It was found that the pneumatic part of the circuit was operating correctly.

The service fitter then removed both of the Park Brake Dump valves, and then replaced them with new components, as these are the only valves in the circuit that control the direction of hydraulic oil flow to the brake circuit.

The machine went back to work on Thursday the 3rd of April and a similar incident occurred on Friday night the 4th of April. The machine was stood down impending further investigation.

On Sunday the 6th of April, a VLI Diesel service fitter replaced the entire hydraulic Logic Block and ancillary valves. He then proceeded to test the machine under operational conditions for approximately four hours and was unable to fault the machine.

VLI Diesel are working in conjunction with the supplier of the hydraulic Logic Block to diagnose the cause of the intermittent fault. The Logic Block off the machine will be bench tested and the stripped down for inspection.

Investigation & Cause:

As a precautionary measure the machine in question will be transported to Mackay to have the hosing on this circuit renewed, the hydraulic system drained, the reservoirs cleaned and resealed before being refilled with new oil.

Both JUG-A-0 UL/UV "V1" and "V2" machines use the same components in this area.

Recommendations:

Carry out the individual Park Brake Dump Valve tests as per the attached OEM Standard Work Method Statement at the next weekly service.
Implement and carry out the OEM individual Park Brake Dump Valve tests as part of every 250, 500, 750 and 1000 hour service instead of only in the 1000 hour service.

Immediate Action:

None.

Future Action:

Investigations are ongoing.
The FMEA results will be circulated promptly post completion.

Supporting Documentation:

None.

Conclusion:

After having carried out trials on the current dump valves on numerous machines & with the supplier it has been found that there can be an issue with the hydraulic side of the operation once the oil temperature becomes elevated.

Below is a report from Mackay Fluid Power describing what they had found during testing:-

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 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 valves.

Thanks and Regards

Terry Vanden Bergh | Project Coordinator

It is our recommendation that the dump valves be replaced with an 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.

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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