



Technical Bulletin / Safety Alert

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Rev: 1

(This document supersedes VLI Diesel TBSA0809-01 & TBS2009-TBSA-03 Rev 0)

Subject: Brake Valve Failure

Date: 31/10/2013

Applicable to: JUG-A-0 UL/UV Machines (N.B. – this may affect other machines using the same valve, owners and end users should consult the relative OEM for their recommendations)

Note: Minimum PPE required to carry out any inspections contained in this TBSA shall be safety eyewear & any site specific requirements. A JSA should be carried out prior to performing these tasks.

Occurrence:

The original release of this TBSA in 2009 followed the occurrence of two collieries experiencing a service braking system failure on a JUG-A-0 UL/UV due to the fracture of a component in the Service Brake Valve (Mico) on the machine. In both cases the operator depressed the Service Brake Valve to find that the pressure holding the SAHR brake units off did not decay. It should be noted that this did not affect the operation of the Park/Emergency Brake system.

This revised release of the TBSA follows the recent occurrence of a similar service brake failure incident on a JUG-A-0 UL/UV at a NSW Colliery. The machine failed to stop on application of the service brake. The machine was stopped using the Park / Emergency Brake.

Investigation Results & Discussion:

The Service Brake Valves from the original failures were stripped down to find that the porting valve had fractured leaving the ball section on one end free to close off the Tank port (T) & leave the Pressure port (P) open to the Actuator port (A), refer Figure 1.

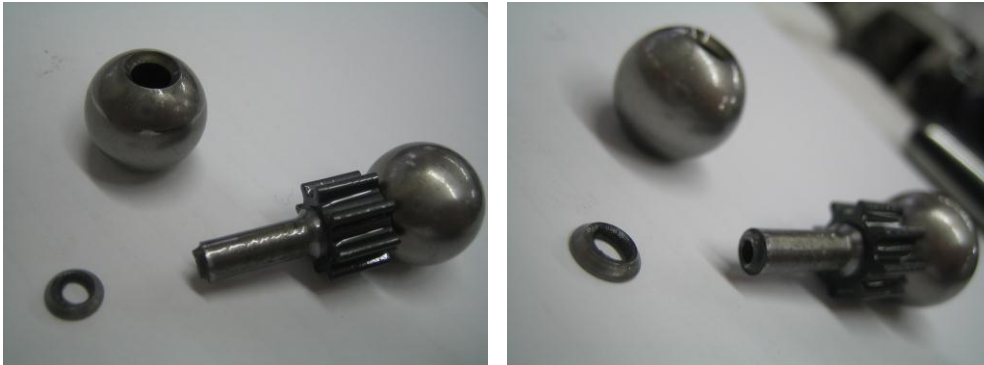


Figure 1: Photographs showing the failed porting valves from the original 2 off service brake valve failures in 2009.

Disassembly of the service brake valve from the most recent incident identified that the porting valve had a small section of metal missing from one of the swaged ends of the shaft connecting the ball sections (the ball sections remained intact and connected), and the spline on the shaft appeared to have fractured and there was a piece missing, which was not recovered, refer Figure 2.

It was considered that the missing spline piece combined with the small piece of swaged metal could have hindered the porting valve operation during service, preventing or reducing oil flow to tank and possibly also leaving the Pressure port (P) open to the Actuator port (A), therefore the oil pressure holding the SAHR brake units off was not able to decay, resulting in the brake valve failure incident reported.



Figure 2: Photographs showing the porting valve from the recent service brake valve failure in 2013, highlighting the missing piece of spline and the fractured metal from one of the swaged ball ends.

To the knowledge of VLI, these 3 service brake valve failures are the only reported failures. The failure mode of the porting valve failures exhibited in each of the 3 reported incidents is one of fatigue. It is understood that each of the reported failures has occurred in a service brake valve with service life exceeding 8000hrs. Based on this information VLI is now recommending the service brake valves on all JUG-0-A UL/UV machines be replaced or overhauled at intervals not exceeding 5000hrs.

Conclusion:

The service brake valve failures reported in this TBSA were caused by the fatigue failure of the internal porting valve assembly. This prevented an adequate rate of decay of oil pressure holding the SAHR brake units off, resulting in the loss of service brake function and the brake valve failure incidents reported.

Recommendations:

Immediate Action:

Carryout toolbox talks with all personnel regarding the failure & reinforce the importance for operators to conduct a pre-shift check on the valve by starting the machine, lifting the park brake valve & depressing the service brake valve to ensure that the brake head pressure is decayed – indicated on brake head pressure gauge on the dashboard.

Future Action:

Ensure JUG-A-0 UL/UV machines are installed with Design Registered braking systems MDR089245TBS or MDR108880TBS-1.

VLI recommends the service brake valve on all JUG-A-0 UL/UV machines be replaced or overhauled at intervals not exceeding 5000hrs service life.

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

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

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