



Technical Bulletin / Safety Alert

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Rev: 0

(This document supersedes all previous versions of DES2014-TBSA-04)

Subject: MDR074246DES Low Water Test Valve Change

Date: 15th September 2014

Applicable to: ALL VLI JUG-A-0 UL/UV Machines with MDR074246DES and MDR074246DES-1

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.

Occurrence:

Since June 2011, VLI have been notified of the occurrence of four (4) separate incidents related to bypassing the over temperature detection devices installed to design registered diesel engine systems (DES) covered under MDR074246DES.

The original incident in June 2011 was associated with the installation of an incorrect DES shutdown system display printed circuit board to the machine, the details of which can be found in VLI Technical Bulletin / Safety Alert DES2011-TBSA-06 Rev 1.

A subsequent incident in November 2013 was also associated with the installation of an incorrect DES shutdown system display printed circuit board to a machine.

Further incidents have occurred in May 2014 and August 2014, where the over temperature detection devices installed to the DES shutdown systems of the machines were intentionally defeated.

All four (4) of the reported incidents resulted in high potential for elevated surface temperatures due to elevated temperatures within the DES exhaust conditioner tank and particulate filter housing.

In all four (4) of the reported incidents, the low water test valve (3 way ball valve), installed to the machines, was left midway between the “run” and “test” positions after completing routine shutdown testing. This resulted in the machines being returned to service without makeup water flowing freely to the exhaust conditioner tank, leading to elevated exhaust temperatures in the conditioner tank.

Investigation Results & Discussion:

Investigation and evaluation by VLI of all four (4) of the abovementioned incidents has determined that the root cause in all cases was human error.

The ability to run VLI JUG-A-0 UL/UV machines with non-compatible DES shutdown system displays has been addressed with a software upgrade as described in VLI Technical Bulletin / Safety Alert DES2011-TBSA-06 Rev 1.

In order to address the intentional pneumatic bypass of the over temperature detection devices installed to the DES shutdown systems, it is recommended to tamperproof the pneumatic hoses in and out of the shutdown system, as described below in Recommendations.

In relation to the low water test valve, VLI has investigated additional measures to remove or reduce the ability for human behavior elements to impact on the integrity of the DES shutdown system.

Consideration was given to change the low water test valve from a 3 way ball valve to a 2 way ball valve to reduce the human behavior risk of leaving the ball valve closed or partially closed after routine low water shutdown testing, by the simple process of reducing the available valve positions from 3 (lever travel through 180°) to 2 (lever travel through 90°). The 2 way ball valve is then either providing make up water to the exhaust conditioner or draining make up water, which will result in a low water shutdown. The 3 way ball valve had the ability to isolate the make-up water from the exhaust conditioner.

A HAZOP study and design change FMEA was completed, which supported this change. VLI subsequently installed and tested a 2 way low water test valve to a system, as depicted in Figure 1, to confirm correct fit and function. VLI now recommends the change from a 3 way ball valve to a 2 way ball valve for the low water test valve on design registered DES covered by MDR074246DES and MDR074246DES-1. The low water test valve decal, as shown in Figure 2, will need to be removed from its location on the exhaust conditioner tank and discarded.

Conclusions:

Investigation and evaluation by VLI of four (4) of separate incidents related to bypassing the over temperature detection devices installed to design registered diesel engine systems (DES) covered under MDR074246DES has determined that the root cause in all cases was human error.

VLI has developed a 2 way low water test valve installation to replace the existing 3 way test valve installation in an effort to reduce the ability for human behavior elements to impact on the integrity of the MDR074246DES shutdown system.

All existing OEM recommended routine service schedules remain unchanged.

Recommendations:

1. Low Water Test Valve Change to 2 Way Valve

VLI recommends all equipment owners and end users of VLI JUG-A-0 UL/UV with design registered diesel engine systems covered under MDR074246DES and MDR074246DES-1 adopt the new 2 way low water test valve as described in this TBSA at the next routine service interval.



Figure 1: New 2 Way Low Water Test Valve Installation.

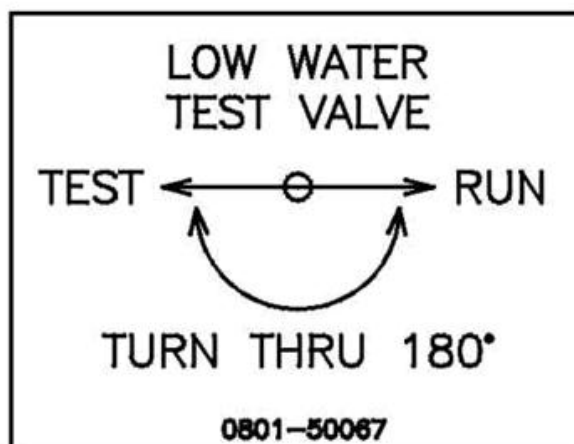


Figure 2: Three (3) Way Low Water Test Valve Decal – Remove and Discard

2. Tamper proofing of shutdown system pneumatic hoses.

In order to detect any tampering with the pneumatic air supply to and from the shutdown system, clear 20mm (inside diameter) heat-shrink should be applied to the air supply hose at the time of making the final hose connections to the system. A date label should be attached to the 'air supply in' fitting/hose & clear heat-shrink applied as shown in figures 3 to 8 below.

It should be noted that the supply air to the shutdown system will be fitted with a filter/drain to remove contaminants. There may be two different versions of this, one with the filter attached directly to the enclosure & the other with the filter/drain attached to the engine rail. The descriptions below show both systems, these systems also show two switched outputs as they are systems with a CH4 horn, base model systems will only have one switched output:

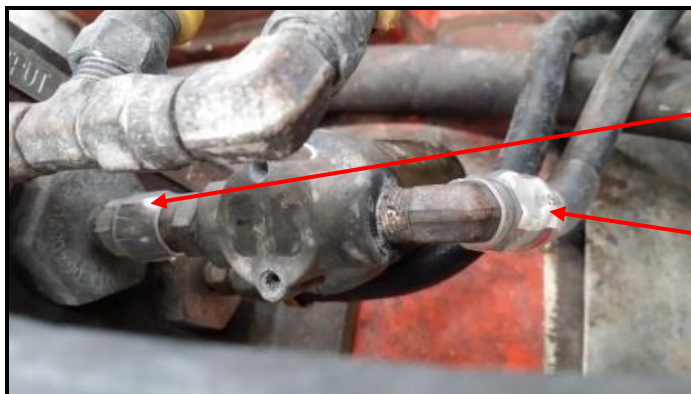
a. System with filter/drain fitted direct:



Date tag & heat-shrink applied to the air supply in –
NOTE: the heat-shrink must cover the end of the swivel nut on the hose tail.

Filter/drain fitted directly to shutdown system enclosure air supply in.

Figure 3



NOTE: for systems with the filter fitted directly there needs to be 2 pieces of heat shrink applied.

- One piece applied to the swivel nut & fitting that attaches the assembly to the enclosure (cut 20mm long).
- One piece that attaches to the supply hose (cut 75mm long)

Figure 4

b. System with filter/drain mounted on engine rail.



Cut heat-shrink to 75mm long & apply so that it fully encapsulates the swivel nut on the hose tail.

Figure 5

Figure 6

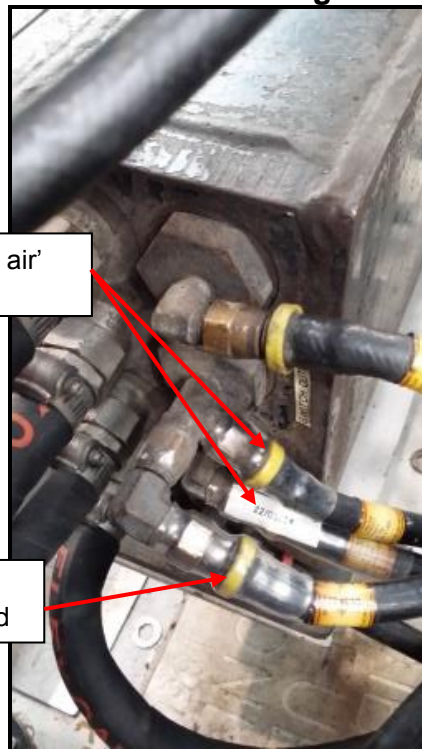
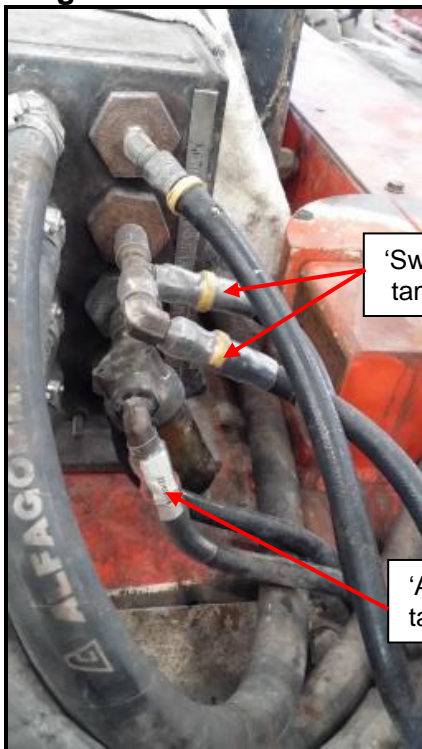


Figure 7

Figure 8

Please ensure this document is circulated to all relevant personnel within your organization. Should you have any further queries please contact your VLI Representative.

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