



Technical Bulletin / Safety Alert

Unique ID No: DES2011-TBSA-06

Rev: 1

Subject: JUG-A-0 UL/UV Diesel Particulate Matter Filter Fire – Incident Notification

Date: 29/02/2012

Applicable to: All JUG-A-0 UL/UV Diesel Engine System Design Registration Nos.
MDR074246DES, MDR074246DES-1 & MDR114991DES

Details of Revision: 0. Original Issue 08/06/2011
1. Software Update Notification 29/02/2012

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.

Background:

On Friday 3rd June 2011 VLI Diesel Division (VLIDD) was advised that a diesel particulate matter (DPM) filter installed in a VLI JUG-A-0 UL/UV had caught fire during operation at a Queensland underground coal mine during the preceding night shift.

Investigation of the incident identified that the shutdown system display printed circuit board installed to the JUG-A-0 UL/UV was not compatible with the machine shutdown system, preventing the system sensing elevated temperatures in the scrubber tank and shutting down. Since the system could not shut down the machine, temperatures elevated to a level that enabled the DPM filters to overheat and ignite.

The content from DES2011-TBSA-06 Rev 0 is attached as Appendix 1 for reference.

Solution:

VLIDD advise the availability of a software update for the JUG-A-0 shutdown system display printed circuit board and charger unit that will prevent JUG-A-0 machines from operating with the incorrect display circuit board or charger unit fitted.

The VLI part information is as follows:

0704-50024 Charger & Display Set, JUG-A-0 Shutdown System

All new and service exchange JUG-A-0 shutdown system charger units and display boards will contain the software update. In order for updated components to be effective, both the display and charger unit must be changed out at the same time. Changing only the display or only the charger will result in a software conflict and the JUG-A-0 will not start.

Each component is labeled with software revision and software compatibility as shown in the following photographs:



Recommendation:

It is recommended that all applicable JUG-A-0 UL/UV equipment owners and end users update equipment with the latest display and charger at the next major electrical code service interval.

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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Appendix 1: DES2011-TBSA-06 Rev 0

Introduction:

On Friday 3rd June 2011 VLI Diesel Division (VLIDD) was advised that a diesel particulate matter (DPM) filter installed in a VLI JUG-A-0 UL/UV had caught fire during operation at a Queensland underground coal mine during the preceding night shift.

VLIDD representatives attended site the same day to assist with the investigation.

Investigation Results & Discussion:

The initial underground investigation conducted by the mine identified that the low water shutdown test valve was closed, preventing make-up water entering the scrubber tank.

Further investigation conducted after the machine was brought to the surface identified that the circuit board installed in the methane display unit was not compatible with the JUG-A-0 shutdown system. Site records identified that the original methane display unit had been replaced onsite by mine personnel in February 2011 with, what was believed to be at the time, a compatible component. It has been confirmed that the unit it was replaced with was only compatible with another OEM loader system and was not compatible with all the functions of the JUG-A-0 shutdown system.

It has been identified that with regards the physical appearance of the circuit boards, the only difference between the two (2) components is an identification label. The JUG-A-0 circuit board includes a “JUG” label (Figure 1) and the circuit board compatible with other OEM systems will not include this label (Figure 2). Each circuit board will also display a unique serial number; however this does not identify compatibility with the machine shutdown system.



Figure 1: JUG-A-0 Display Unit highlighting the “JUG” label attached to the circuit board.



Figure 2: Other OEM Display Unit highlighting the absence of the “JUG” label.

The VLI JUG-A-0 UL/UV explosion protected diesel system includes an exhaust assembly that provides a path for exhaust gases to pass through a wet scrubber, a positive flame trap and finally through DPM filters to atmosphere. The water make-up tank has a low water shut down system, which shuts the machine down when the water level in this tank falls below a preset level. The exhaust scrubber system contains 3 RTD sensors, which provide information to the machine shutdown system. One RTD sensor is fitted close to the raw exhaust inlet, another is between the flame trap and the DPM filters and the last is in the outlet pipe. Should the temperature at any of these locations exceed the preset limit, the machine will shut down.

The display unit circuit board on the JUG-A-0 UL/UV is linked into the control circuit for the machine shutdown system. When the low water shutdown test tap was placed in the closed position the make-up water tank could not supply water to the scrubber tank. When the scrubber water evaporated to a point where it was no longer cooling and filtering the exhaust gasses, the RTDs should have sensed the elevated temperature and shut down the machine. As the circuit board that was fitted to the machine was not compatible with the JUG-A-0 shutdown system, it was unable to read the temperature sensors and therefore could not shut down the machine. Exhaust gas temperature in the scrubber tank then continued to elevate to a level that enabled the DPM filters to overheat and ignite. The exhaust flame trap between the raw gas inlet and the DPM filters was found to be intact.

Conclusions:

The DPM filter fire that occurred on the JUG-A-0 UL/UV was the result of a compromised safety shutdown system.

The water make-up tank test tap had been closed, preventing water entering the scrubber tank, leading to elevated exhaust gas temperatures developing in the scrubber tank.

The circuit board installed to the JUG-A-0 UL/UV was not compatible with the machine shutdown system, preventing the system sensing elevated temperatures in the scrubber

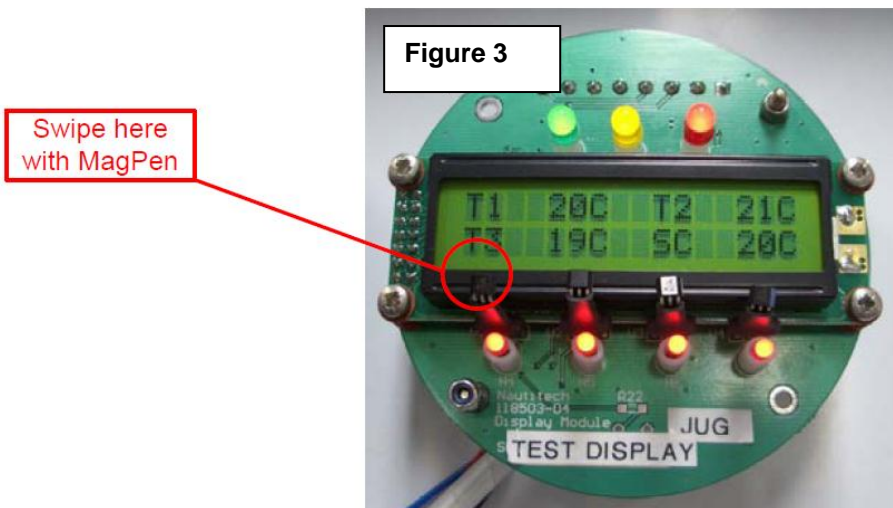
tank and shutting down. Since the system could not shut down the machine, temperatures elevated to a level that enabled the DPM filters to overheat and ignite.

Recommendations:

- Ensure all OEM maintenance and service procedures are followed.
- Ensure only correct OEM parts are used.

Immediate Action:

- All JUG-A-0 UL/UV equipment owners and end users to inspect machines for correct operation of shutdown systems and correct circuit board installation as per following procedure.
- The simplest method for checking the correct circuit board is installed to the machine is to power up the display unit and using magnetic pen swipe the far left key and observe that the screen will display the temperatures at T1, T2, T3 and SC (supercharger), which identifies that all sensors are operating correctly (Figure 3).



Future Action:

VLIDD will investigate, with the manufacturer of the display unit and circuit board, a method to ensure that JUG-A-0 machines will not operate with the incorrect circuit board fitted and notify the industry of any changes via a future TBSA (Now complete with the issue of this TBSA “DES2011-TBSA-06 Rev 1” 29 February 2012).