

Technical Bulletin / Safety Alert

Unique ID No: DES2011-TBSA-05

Rev: 0

Subject: MDR090376DES Exhaust System - Incident Notification

Date: 2/06/2011

Applicable to: VLI Diesel Pty Ltd Diesel Engine Systems covered under design registration no. MDR 090376 DES (Driftrunner & Brumby)

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.

Introduction:

On Friday 13th May 2011, VLI Diesel Division (VLIDD) was advised an unserviceable exhaust system scrubber tank (covered by NSW design registration MDR 090376 DES) had been removed from a Driftrunner vehicle explosion protected diesel engine system.

The vehicle had completed its hire at a Queensland coal mine and was undergoing post hire repairs at a 3rd party maintenance facility.

During the post hire repairs evidence of scrubber tank expansion had been identified. The optional purifier element assembly fitted to this exhaust system was found to be damaged.

The vehicle, exhaust scrubber tank and associated exhaust system components were returned to VLIDD Mackay workshop Friday 27th May 2011 for examination and investigation.

Investigation Results & Discussion:

A meeting was convened on 27 May 2011 with stake holders including a representative from the Department of Employment, Economic Development and Innovation to visually examine, discuss possible causes and map an investigation plan.

Vehicle details as follows:

- Driftrunner Serial Number: 5387
- Manufacture Date: 24/01/2009
- Hours: 3,687

On visual inspection the system exhibited no evidence of a breach of explosion protected integrity. A code D mechanical inspection was completed on 28/05/2011 confirming the explosion protected integrity of the system. It was noted that the last code D mechanical inspection was conducted 2,419 hours prior.

Figures 1 and 2 show the scrubber tank and purifier element assembly as received by VLI, where the tank expansion and purifier element damage can be seen.

Visual examination of the purifier identified excess buildup of contaminants such that light was not visible through the intact sections and collapse of the purifier substrate apparent on one side.

It was agreed that a comprehensive Root Cause Analysis (RCA) be conducted and OEM recommendations be made for assessment of scrubber and purifier assemblies in existing MDR 090376 DES systems.



Figure 1: Exhaust Tank Expansion.



Figure 2: Exhaust Purifier Element Deformation / Damage

Conclusions:

The exhaust system components from Driftrunner 5387 when tested as per AS/NZS 3584 indicated no breach of explosion protected integrity.

VLI conduct code D examinations at time of manufacture as per AS/NZS 3584. In house testing has shown the scrubber will exhibit deformation on front and rear sides (as installed) as a result of the pressure test. A maximum deformation has been nominated for assessment purposes (see procedure below).

Purifier damage appears to be due to excess buildup of contaminants. This could be attributed to poor fuel, incorrect or poorly maintained fuel systems and/or abnormal duty cycle. A maximum exhaust back pressure is nominated to assist in identifying purifier/scrubber condition.

Recommendations:

- Ensure all OEM maintenance and service procedures are followed.
- Ensure only OEM parts are used.
- Carry out scrubber tank assessment as per procedure below and report any non-conformances to the OEM.
- Carry out exhaust back pressure test as per procedure below and report any non-conformances to the OEM. This test should be repeated and recorded at mandatory exhaust analysis intervals.
- Exhaust emissions should be monitored post purifier as an indicator of effective function.

Future Action:

- Root Cause Analysis (RCA) completion and review.
- Findings published in follow up TBSA.

Supporting Documentation:

Scrubber inspection

- To be conducted by competent persons
- Ensure machine isolation procedures are followed
- Ensure measurements are taken from nominated points perpendicular to the inside surface at the level indicated (Max deformation 15mm front face and 11mm rear face)

Front surface measure approximately 270mm down from top



Front surface Maximum deflection 15mm

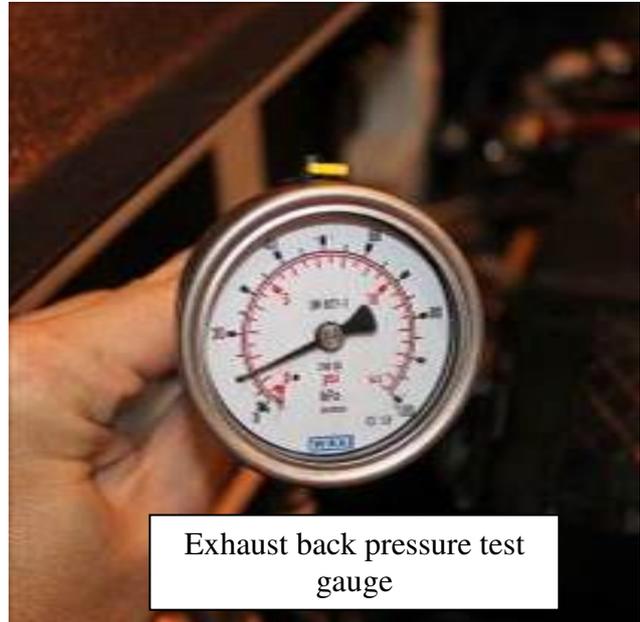
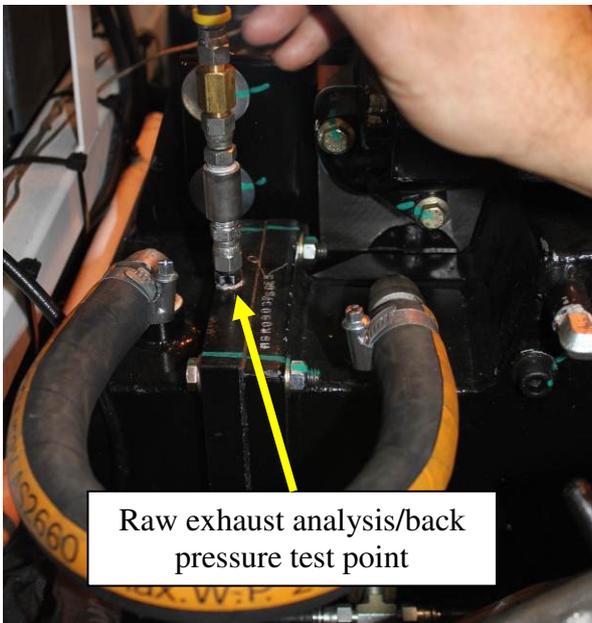
Rear surface measure approximately 330mm down from top



Rear surface Maximum deflection 11mm

Exhaust back pressure test procedure

- To be conducted by competent persons
- **Caution** - The test point directly accesses the raw gas path and mine site policies and procedures should be followed
- Ensure machine isolation procedures are followed
- Remove particulate filters if fitted
- Remove test point cap
- Fit back pressure gauge P/No 5-04067102 (A restrictor P/No 5-04160137 may be required to reduce needle fluctuation)
- Start machine
- Check back pressure reading at high idle (Max 20kpa) and record
- Shut machine down
- Ensure machine isolation procedures are followed
- Remove gauge and refit test point cap prior to further operation



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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