Van Guard

Bulkhead Test Report

A257S01

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Van Guard Bulkhead Test

Contents

SUMMARY

A static loading test based on the requirements of *BS ISO 27956:2009* was undertaken on an aftermarket van bulkhead produced by Van Guard at TRL on the 17th February 2011.

Customer	Van Guard
Test Facility	Impact Sled Facility / Squeeze Rig
Test Number	A257S01
Test Date	17/02/2011
TRL Test Engineers	Chris Walker / Alex Thompson
Report Author	Alex Thompson

A257S01

Test Details

Test Procedure	Based on BS ISO 27956:2009
Test Description	“Type 1” static load test
Test Object	Punched steel bulkhead
Test Mass	925 kg
Applied Force	9.07 kN

Test Requirements

BS ISO 27956:2009 states that a bulkhead should be able to withstand a force equivalent to half of the maximum payload of the vehicle multiplied by 1g, with permanent deformation of the bulkhead not exceeding 300mm.

The standard specifies a force applied horizontally using a 1m x 1m square plunger piston to a bulkhead mounted in a van body. However, an equivalent test is to mount the bulkhead horizontally in a rigid frame representative of the installation in a van and apply a vertical load using a 1m x 1m mass. This was the test type used in this case.

Test Object

The test object used in this test was a sheet steel bulkhead with a punched section at the upper part of the bulkhead. The bulkhead was a vehicle-specific design intended for use in the Peugeot Boxer / Fiat Ducato / Citroën Relay (’06 on) van models, where the largest variant (L4) has a maximum payload of 1850kg.

Test Setup

The bulkhead was mounted in the test rig on a rigid frame representative of the fitment in the van. Two displacement transducers were attached to the underside of the bulkhead to measure the deformation of the bulkhead during the test.

The required force to be applied to the bulkhead was calculated as follows:

$$F = 0.5 \times m_p \times g$$

Where

F is the test force in N
m_p is the maximum payload in kg
g is the acceleration due to gravity (9.81 m/s^2)

Therefore

$$F = 0.5 \times 1850 \times 9.81 = 9074.25 \text{ N}$$

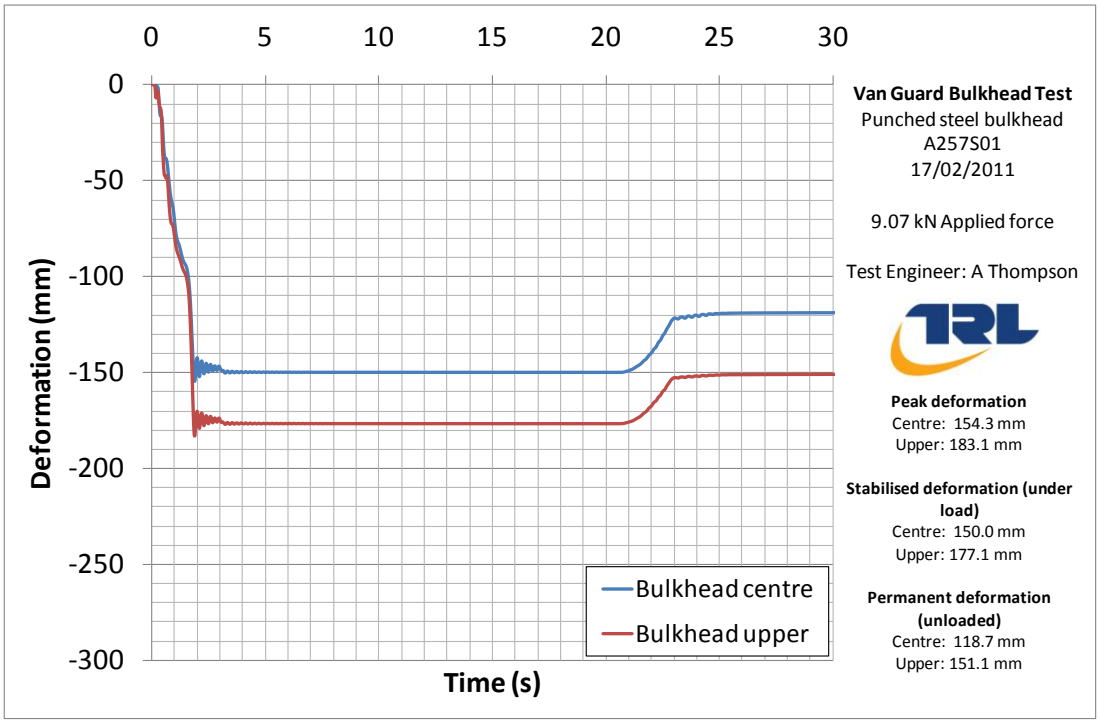
This force can be applied vertically by a mass of 925 kg under the influence of gravity.

The force was applied to the centre of the bulkhead, which was measured according to its maximum height and width as shown in the photographs below:

Test Observations

The following observations were made during the test:

- The full force was applied within 2 seconds of first loading
- The load was applied for a time period in excess of 10 seconds
- The bulkhead deformation was measured to a peak level of 183.1mm at the upper part of the bulkhead during the test, which reduced to 177.1mm once the load had stabilised
- The load was removed from the bulkhead and there was some 'spring back' of the bulkhead, resulting in a permanent measured deformation of 151.1mm
- All of the recorded deformation values were well within the limit of 300mm for permanent deformation as specified in the standard.



- No sharp edges or other deformations were observed on the bulkhead during or after the test which may directly or indirectly result in injuries to the vehicle occupants.

Visual Documentation

Pre and post test still photographs of the bulkhead test can be found in the folder “A257S01/Stills” on the test CD.

Real time video of the bulkhead test can be found in the “A257S01/Video” folder on the test CD.