Test Summary Report

Vehicle Advertising System Trials

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Test Objective/Method

The object of the durability trails was to subject an articulated commercial vehicle trailer, fitted with a new Traxx advertising sign, to misuse and potential in-service damage to ensure the integrity of the fixings and material when driven at various UK commercial vehicle road speeds. The system was tested on the MIRA proving ground with road speeds up to 65 mph (105 km/h).

Digital photographs and video filming was carried out showing all test conditions and results.

Specimen Description/Part No(s)

New advertising signs were fitted to the left and right sides of a 40ft commercial vehicle articulated box trailer provided by Carmelion.

A Mercedes Actros tractors unit was provided by MIRA

Test Number

1028510

Test Date

17th January 2011

Test Equipment

The MIRA Ride and Handling test circuit was used to test the installation of the sign and its aluminium fixing system to vibration and body twist inputs.

The MIRA Dry Handling and Stability Circuit was used for the various sign durability and speed tests.

Digital photographs and video filming equipment.

Results

Test preparation.

New advertising signs were installed by Traxx on both left and right sides of the box trailer. The new elements of the sign fixing frame were mounted to the existing support framework already fixed to the trailer.

To check that the newly fitted sign system was installed correctly to the existing mounting frame the vehicle combination was driven for three laps of the MIRA ride and handling test circuit. The circuit has many features that input both vertical and twisting forces into the trailer. On completion of the three laps the sign fixing system was inspected, no issues were found.

On completion of the ride and handling phase a series of tests were conducted around the MIRA dry handling test circuit. This test circuit was used to introduce corning and twisting as well as allowing the vehicle combination to be driven at speeds up to 65 mph (104km/h).

The two signs were tested independently with the right side of the trailer used for testing the mounting system and the left side used for testing both the mounting system and the sign material.

For each test condition the vehicle combination was driven for two complete laps of the dry handling circuit for each test. On completing two laps the sign and mounting system were inspected.

The frame test was carried out on the right side of the trailer. For each test, sections of the mounting system were either released from the supporting frame or removed.

The left side of the trailer was used for the tear test and the sign material was cut both horizontally and vertical with cuts increasing in length for each test.

The first 6 tests were carried out on the right side mounting frame and the following 9 tests were carried out on the left side frame and sign.

After completing the driven tests the sign material was vandal tested for strength by tearing rearwards from the top of the final vertical cut.

The following list contains a description of the tests and the results.

Frame Tests.

Test 1. The primary sign retaining system on the right side was unclipped from the horizontal rail from a point 2 meters back from the front vertical mounting for a length of 2 meters.

After completing two laps of the test circuit, the system was inspected for increased detachment or damage. There was no further detachment or damage to the retaining system or sign.

Test 2. The sign primary retaining system was unclipped from the front lower corner to the end of the 6 meter lower length.

After completing two laps of the test circuit the system was inspected. The forward plastic corner cover was still retained and was holding the front of the rail against the trailer side. The lower keder section of the sign had split at the joint between the two lower rails but the next rail was still retained with no issues. The secondary retaining section of the front mounting rail was still connected to the body mounting frame.

Test 3. The lower corner plastic cover plate was removed and the full length of the horizontal rail was re-clipped. The vertical rail was unclipped from the lower corner vertically for 1 meter.

After completing two laps of the test circuit the system was inspected. There was no further unclipping of the vertical rail and no damage to the sign or lower mounting rail. The secondary retaining section of the rail was still connected to the body mounting frame.

Test 4. In addition to the 1 meter vertical rail the lower rail was unclipped for the full 6 meter length.

After completing two laps of the test circuit the system was inspected. There was no further unclipping of the vertical rail and no further damage to the keder.

Test 5. The lower rail was refitted. The plastic top corner cover plate was removed and the front vertical rail was unclipped and removed.

After completing two laps the system was inspected. The sign had moved rearwards in both the top and bottom mounting rails by 25mm. There was only slight damage to the lower plastic section of the sign mounting system due to contact with the bottom rail end. Due to the contact with the bottom rails the sign did not move further rearwards. If the lower mounting had not been trapped by the lower frame the sign may have travelled further rearwards in the both the upper and lower frame system.

Test 6. The lower rail was unclipped for the full 6 meter length. The vertical rail was not refitted. On the first lap the secondary mounting on the lower rail became detached and the sign was bent backwards, with the lower front corner folding back over the roof of the trailer.

After completing two laps the system was inspected. The top of the sign had moved rearwards in the top rail by approximately 120 mm. Where the rear section of the lower rail had retained the sign the material had torn for approximately 320 mm. The sign was pulled forwards and all the fixing rails were refitted and clipped. With the exception of the tear at the lower rail joint there was no damage to the fixing system or the sign after the frame tests.

Tear Tests.

Test 7. The sign on the left side of the trailer was cut for a length of 500 mm. The cut was made 500 mm back from the vertical rail and 500 above the horizontal rail.

After completing two laps of the test circuit the sign was inspected. There was no increase in the cut length.

Test 8. The cut was extended rearwards by 500 mm to a length of 1 meter.

After completing two laps of the test circuit the sign was inspected. There was no increase in the cut length.

Test 9. The sign was cut from the front end of the horizontal cut vertically for 500 mm.

After completing two laps of the test circuit the sign was inspected. There was a tear of 12 mm at the end of the horizontal cut and a delaminating of the sign surface coating for a further 10 mm. There was a tear of 10 mm at the end of the vertical cut.

Test 10. The horizontal cut was extended rearwards to a length of 2 meters.

After completing two laps of the test circuit the sign was inspected. There was no increase in the tear at the end of the vertical cut. There was separation of the surfaces coating from the backing of 2.5 mm at the end of the horizontal cut.

Test 11. The vertical cut was extended downwards to the lower mounting rail. This allowed the lower section of the sign to fold down exposing the trailer side panel.

After completing two laps of the test circuit the sight was inspected. The tear at the top end of the vertical cut had extended to 12 mm and the delaminating at the end of the horizontal cut had increased to 5 mm.

Test 12. The vertical cut was extended by 500 mm to 1.5 meters.

After completing two laps of the test circuit the sign was inspected. The top of the vertical cut had torn for 2.5 mm and there was delaminating of 1 mm. There was no additional delaminating or tearing to the horizontal cut.

Test 13. The horizontal cut was extended for the full length of the sign.

After completing two laps of the test circuit the sign and the mounting rails were inspected. There was no further damage to the sign and the lower mounting frame was still attached.

Test 14. After completing the Dry Handling tear test the vehicle combination was driven for two laps of the Ride and Handling circuit to test the integrities of the lower mounting frame without the tension support provided by the sign material.

After two laps the lower frame was inspected and there were no issues with the retention of the frame.

Test 15. On completion of all the tests the sign was subjected to a vandalising test. This was carried out by physically tearing the lower corner of the vertical knife cut rearwards. This proved to be very difficult and required two people to complete a tear of approximately 6 meters. The resulting tear showed numerous threads from the backing material and did not progress in a continuous horizontal line indicating that the backing material failed randomly between each weft and warp.

Conclusions

Both the frame and sign system completed the tests without failure. If any of the retaining frame became detached it would be easy to refit without special tools. Extensive damage to the sign material could be seen and if necessary the sign could be removed easily to allow the vehicle to be driven safely.

Attachments/Notes

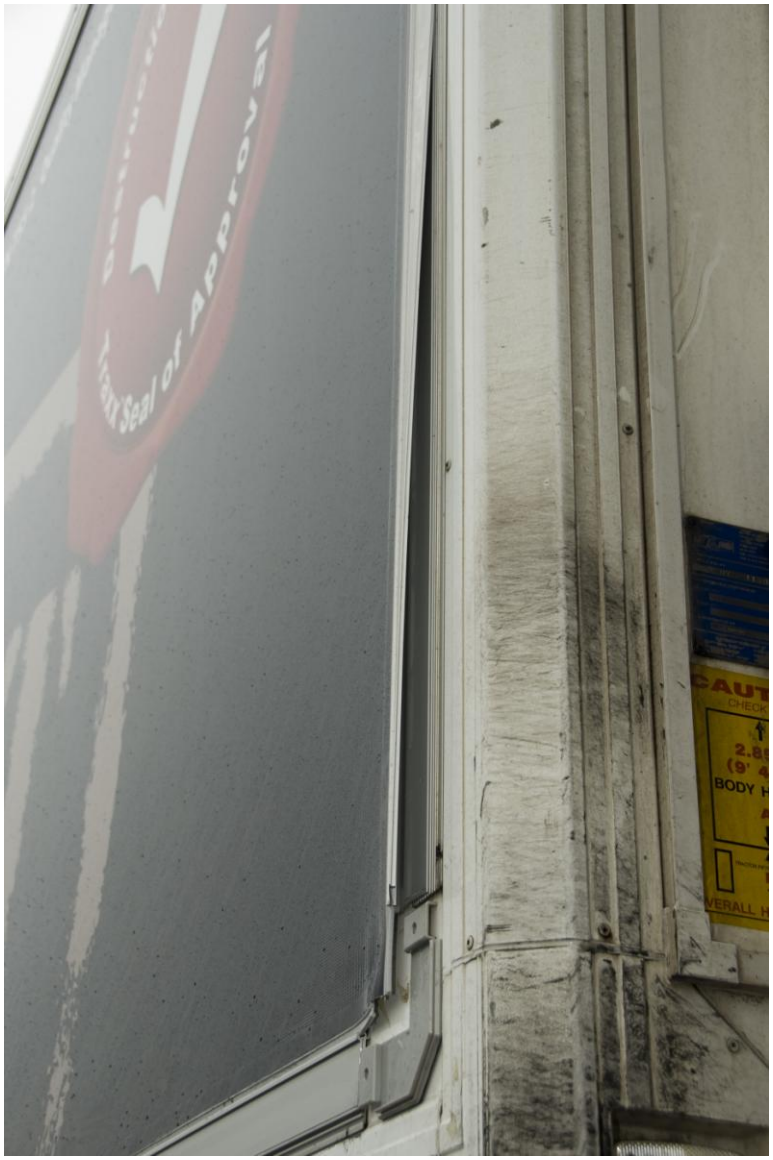
Photographs of the sign before and after each test.

Test 1 Horizontal frame unclipped for 2 meter, 2 meter back from the vertical frame

Test 2 Horizontal frame unclipped for 6 meter length

Test 2 Lower corner cover plate retaining the horizontal frame rail after test.

Test 2 Tear in the lower plastic section of the sign mounting system



Test 3 The horizontal frame is re-clipped and the lower corner cover plate removed. 1 meter of the vertical frame rail was unclipped from the lower corner.

Test 4 The horizontal lower frame was unclipped for the full 6 meters as well as the vertical frame remaining unclipped for 1 meter.

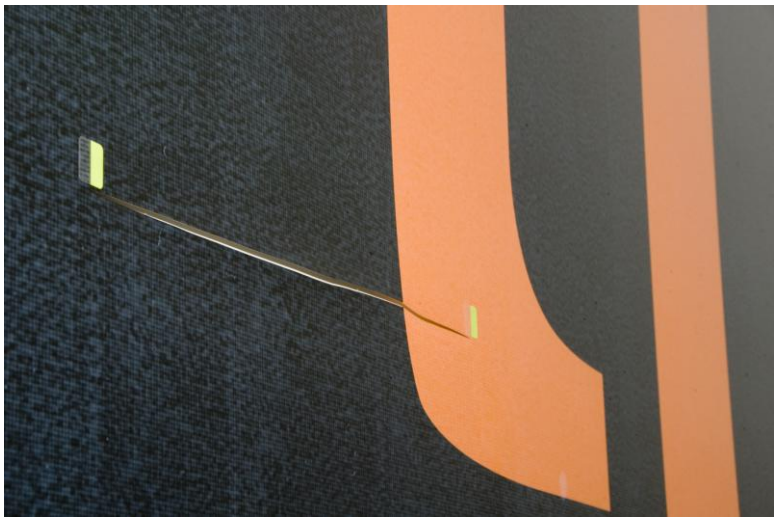
Test 5 The horizontal frame rail was re-clipped and the top corner cover plate removed. The vertical frame rail was completely removed.

Test 5 After completing two laps the plastic lower moulding for the sign was trapped in the lower horizontal rail.

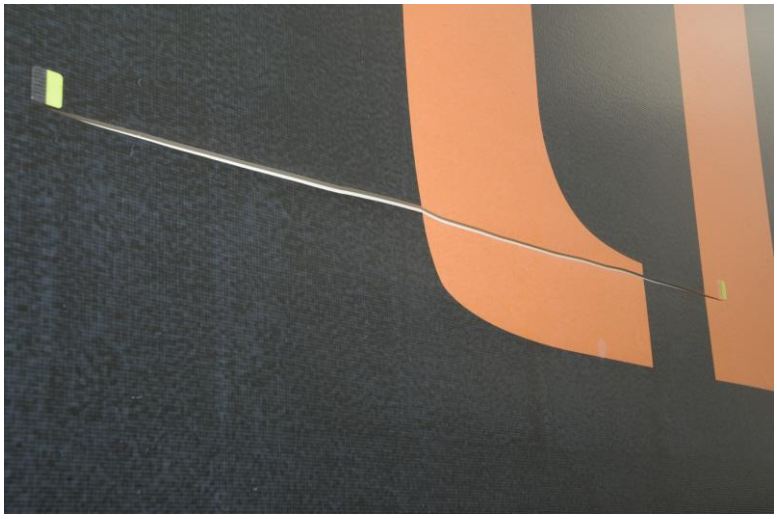
Test 6 The horizontal lower frame was un-clipped and the vertical rail was not refitted.

Test 6 The lower frame rail became fully detached and the sign moved rearwards in the top frame rail.

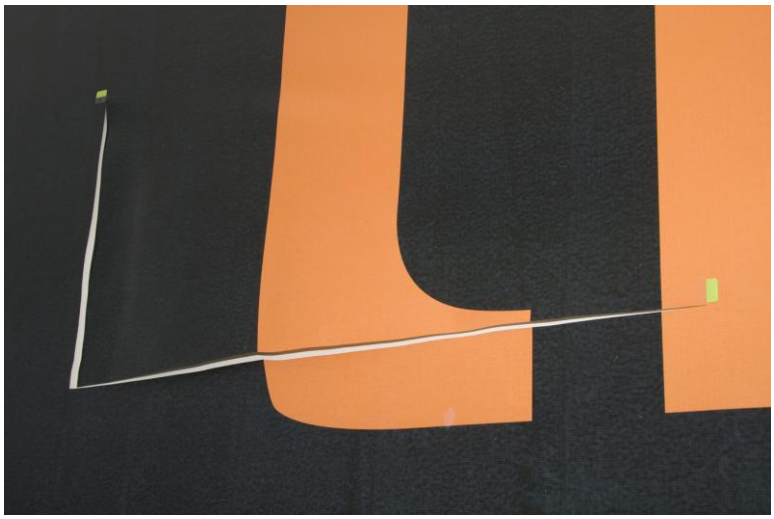
Test 6 The sign material tore at the attached rear lower horizontal frame



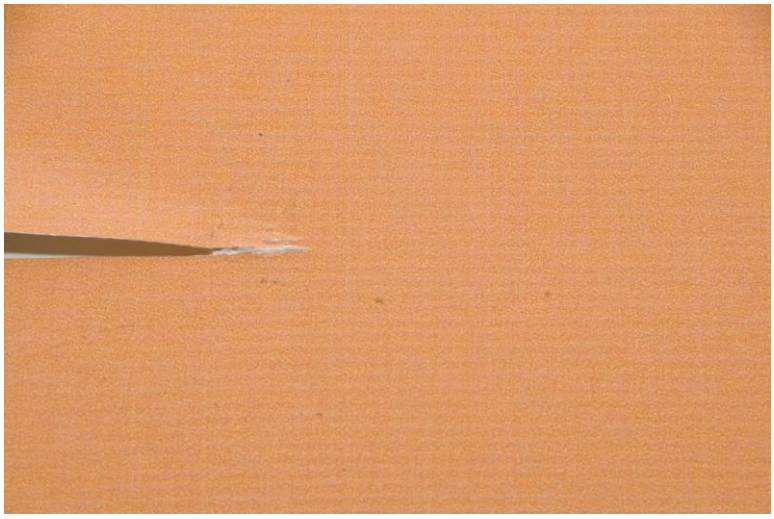
Test 7 Horizontal cut of 500 mm, 500 rearwards of the front frame and 500 mm above the horizontal lower frame



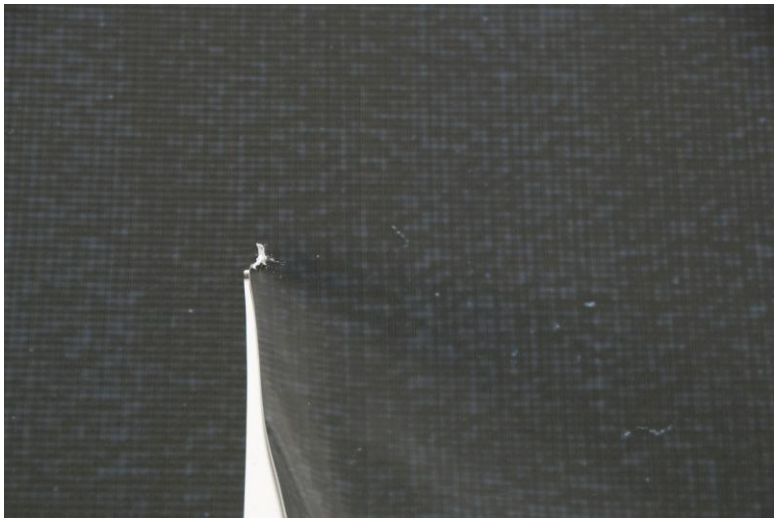
Test 8 Horizontal cut extended to 1 meter



Test 9 Vertical cut for 500 mm from the front of the 1 meter horizontal cut



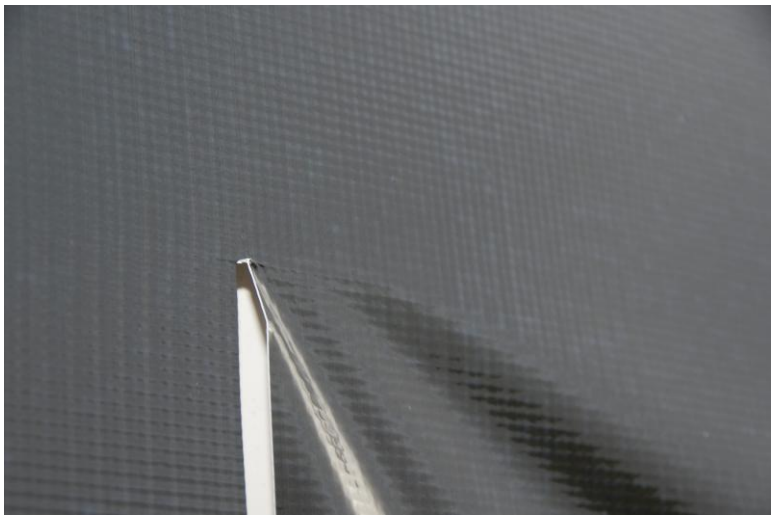
Test 9 12 mm tear at the end of the horizontal cut with 10 mm delaminating of the material surface coating



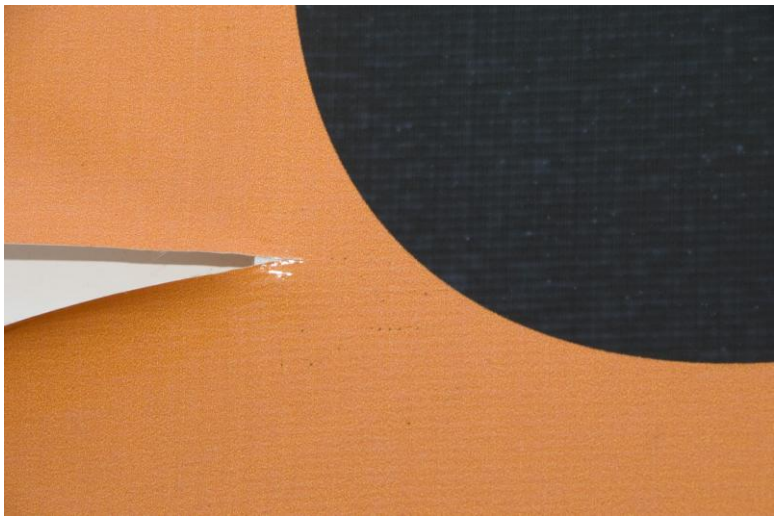
Test 9 10 mm tear in the end of the vertical cut

Test 10 The horizontal cut extended to a length of 2 meters

Test 11 The vertical cut was extended down to the lower horizontal frame rail



Test 11 The tear at the top of the vertical cut extended by 2 mm



Test 11 12 mm delaminating at the end of the horizontal cut

Test 12 The vertical cut was extended by 500 mm to a length of 1.5 meters

Test 13 The sign was cut for the full length of the trailer.

Test 15 The sign material was physically torn rearwards from the knife cut to emulate typical vandalism.