

TECHNICAL REPORT

Road Vehicle Tyre Puncture Repair
Solution (ADD-SEAL) Test at MIRA UK

Commissioned by

RAC (Royal Automobile Club)

November 2013

Road Vehicle Tyre Puncture Repair Solution Test

All Testing to be conducted at MIRA, Nuneaton.

Test Schedule TRT 13

The test is designed to assess the serviceability of a tyre puncture repair system intended for use in motor vehicle tyres used on the public highway.

A wheel/tyre combination will be prepared at RAC workshops at Bescot (Walsall) with photographs taken to record the condition prior to the test. The wheels and tyres will be quarantined until they are fitted to the test vehicle at MIRA on the test day. After testing the wheel / wheels will be removed from the test vehicle and the original ones fitted. This ensures that the test wheel / wheels are not used on the public highway.

Test Vehicle --- Ford Galaxy.

Dynamic Test Procedure at MIRA (Part A)

- 3 Laps of the Pave' circuit at 28mph.
- 3 Emergency brake tests at approximately 0.5g deceleration from 30mph (No 2 Circuit).
- 3 Acceleration tests up to the point of wheel slip to 30mph (No 2 Circuit).
- 6 Laps of the Steering Pad (3 clockwise and 3 anti-clockwise) at 30mph.

Note: Visual inspection and pressure test after each section.

Dynamic Test Procedure at MIRA (Part B)

- 2 Laps of the No 2 Circuit at 60mph, using the corners to scrub off speed.
- 2 Laps of the No 2 Circuit at 70mph, braking into the corners to reduce speed.
- 3 Laps of the no 2 Circuit, with the speed on each straight at 95/100mph, using heavy braking into the corners. During the last two laps conduct an Emergency Stop from 95/100mph on the long straight.

Note: Visual examination of the tyre and pressure after each section. If no defects are visible and no pressure loss recorded the final part of the test can be conducted.

- 20 Laps of the Steering Pad in both clockwise and anti-clockwise directions. (To impose as much side load scrub as is practical). This consists of 5 laps clockwise followed by 5 laps anti-clockwise until all 20 laps have been completed.

If the tyre pressure and condition is acceptable (considering the extreme loading imposed by the test) the repair system will be considered as acceptable, particularly if a speed and distance restriction is imposed.

The wheel / wheels and tyres are to be removed from the test vehicle and tested the following day for pressure loss.

Photographs of the post test tyre condition are to be taken as a reference to the pre test condition to understand the conditions which the test has imposed on the tyre repair system.

J A Clayton Oct 2013.

Road Vehicle Tyre Puncture Repair Solution Test

RESULTS of Test Schedule TRT 13 conducted on Add-seal

The test is designed to assess the serviceability of a tyre puncture repair system intended for use in motor vehicle tyres used on the public highway.

Two wheel and tyre combinations were prepared at RAC workshops at Bescot (Walsall) with photographs taken to record the condition prior to the test. A 4mm probe was used to puncture both tyres which were removed prior to the sealant being applied to the deflated tyres. The wheels and tyres were quarantined until they are fitted to the two front wheel positions on the test vehicle at MIRA on the test day. After testing the two "test" wheels were removed from the test vehicle and the original ones fitted. This ensured that the test wheels were not used on the public highway.

Test Vehicle --- Ford Galaxy.

Dynamic Test Procedure at MIRA (Part A)

- 3 Laps of the Pave' circuit at 28mph. Start pressure was 38 psi, pressure at end of test was 40 psi.
- 3 Emergency brake tests at approximately 0.5g deceleration from 30mph (No 2 Circuit).
- 3 Acceleration tests up to the point of wheel slip to 30mph (No 2 Circuit). Pressure at the end of this test was 40psi.
- 6 Laps of the Steering Pad (3 clockwise and 3 anti-clockwise) at 30mph. Pressure after this test were 41psi on both tyres. No visual deterioration was evident other than that associated with this type of test.

Dynamic Test Procedure at MIRA (Part B)

- 2 Laps of the No 2 Circuit at 60mph, using the corners to scrub off speed. Pressure at the end of this test was 41psi N/S/F and 42psi O/S/F, no abnormal deterioration visible.
- 2 Laps of the No 2 Circuit at 70mph, braking into the corners to reduce speed. Pressures at the end of this test were the same as above with no change to the tyre condition.
- 3 Laps of the no 2 Circuit, with the speed on each straight at 95/100mph, using heavy braking into the corners. During the last two laps conduct an Emergency Stop from 95/100mph on the long straight. Pressures at the end of this test were 44psi O/S/F and 43psi N/S/F, again no visual abnormal deterioration.
- 20 Laps of the Steering Pad in both clockwise and anti-clockwise directions at 40 mph. (To impose as much side load scrub as is practical). This consists of 5 laps clockwise followed by 5 laps anti-clockwise until all 20 laps have been completed.

This test is extreme and is known to cause feathering on the outside shoulders of front tyres due to the high slip angle of the steered wheels.

Pre test Tyre pressures were 40psi on both tyres. Post test pressures were 41psi N/S/F and 42psi O/S/F.

Following close examination of both tyres pre and post test, the tyre pressure increase with heat during the test, and the pressure retention following the test; I can report that the post puncture repair solution has passed this assessment test. Provided it is ONLY used as a temporary repair with speed and distance limits imposed, and the punctured tyre is permanently repaired within the limits imposed, the repair solution is acceptable.



Nearside tyre Pre-test



Offside tyre Pre-test



Nearside tyre Post test



Offside tyre Post test



Shoulder feathering post test

J A CLAYTON November 2013.