

## Test Summary

# High Speed Running with AlloyGator Rim Protectors

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Authority: Proforma  
Test Date(s) 19th - 20th February 2014

Witnesses: Seth Mayhew  
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### Test Objective/Method/Specification No

A vehicle fitted with AlloyGator rim protectors was driven at high speed to a 'Simulated Autobahn' test cycle. The purpose of the testing was to check the integrity of the AlloyGators when driven at high speed.

The testing was conducted on MIRA's high speed test track with the test vehicle achieving a maximum speed of approx. ~125 mph on the straights and approx. ~105 mph on the 33° banked bends. Each 'Simulated Autobahn' test had a distance of approx. ~92 miles. The testing was conducted over two days.

### Specimen Description/Part No(s)/Delivery Dates

AlloyGator rim protectors. These were inserted and fixed between the tyres and rims of the wheels by AlloyGator. An example of an AlloyGator fitted to a wheel is shown in Figure 1.

The test vehicle was an Audi Quattro Mark 1 TT (Registration: A 64TOR) as shown in Figure 2.

Two of the car's rims were fitted with Pirelli tyres and two rims with Bridgestone tyres. Details of the

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tyres were as follows:

2 x Pirelli P Zero 225/40 R19 92Y

2 x Bridgestone Potenza 225/40 R18 88Y

As per the vehicle's recommended tyre pressures, the front axle tyres were set to 2.6 bar (38psi) and the rear axle tyres were set to 2.5bar (36psi).

### Test Number(s)

The following tests were performed:

#### **Test 1 (day 1)**

Autobahn Simulation (~92 miles) without AlloyGator rim protectors fitted to the wheels of the vehicle. Pirelli P Zero tyres were fitted to the front axle and Bridgestone Potenza tyres were fitted to the rear axle.

#### **Test 2 (day 1)**

Autobahn Simulation (~92miles) with AlloyGator rim protectors fitted to the Pirelli P Zero tyres/rims on the front axle. The RHS rear Bridgestone Potenza tyre/rim had an AlloyGator fitted; however the LHS rear Bridgestone Potenza tyre/rim did not have an AlloyGator fitted.

#### **Test 3 (day 2)**

An Autobahn Simulation (~92 miles) with a reduced speed of 100 mph on the bends. The Bridgestone Potenza tyres were fitted on the front axle and the Pirelli P Zero tyres fitted on the rear axle. All wheels had AlloyGator rim protectors fitted.

#### **Test 4 (day 2)**

Autobahn Simulation (~92 miles) with AlloyGator rim protectors fitted to all wheels. The Bridgestone Potenza tyres were on the front axle and the Pirelli P Zero tyres on the rear axle.

#### **Test 5 (day 2)**

Autobahn Simulation (~92 miles) with AlloyGator rim protectors fitted to all wheels. The Bridgestone Potenza tyres were on the front axle and the Pirelli P Zero tyres on the rear axle.

### Test Equipment

MIRA High Speed Test Track

Vbox

## Results

### Test 1 (day 1)

The vehicle completed the Autobahn Simulation without any issues. There was no loss of pressure to any of the tyres.

### Test 2 (day 1)

In preparation for this test, AlloyGator rim protectors were fitted between all tyres/rims. However, when an AlloyGator was fitted to one of the rear Bridgestone Potenza tyres/rims the tyre began to lose pressure. Therefore, the tyre was removed from the rim and it was seen that there was damage to the bead of this tyre. Therefore, as there was not a spare tyre available, it was decided to conduct Test 2 without an AlloyGator fitted to this tyre/rim (LHS rear).

Upon completion of Test 2 it was seen that:

- The AlloyGator on the RHS front wheel (with Pirelli P Zero tyre) had moved as shown in Figure 3.
- There was no movement to the AlloyGators on the LHS front and RHS rear wheels.
- There was no loss of pressure to any of the tyres.

### Test 3 (day 2)

Prior to conducting this test, AlloyGator supplied a replacement Bridgestone Potenza tyre to replace the tyre with the damaged bead. This new tyre was fitted to the rim and then an AlloyGator rim protector was fitted to this wheel. The AlloyGator rim protector that had moved during Test 1 was re-fitted to its correct position.

In addition the wheels were swapped between the axles. Therefore, the Bridgestone Potenza tyres were on the front axle and the Pirelli P Zero tyres on the rear axle.

The test was run with a reduced maximum speed of 100 mph on the bends.

Upon completion of Test 3 it was seen that:

- There was no movement to any of the AlloyGators.
- There was no loss of pressure to any of the tyres.

### Test 4 (day 2)

Upon completion of the test it was seen that:

- Part of the AlloyGator on the LHS rear wheel (with Pirelli P Zero tyre) had moved outwards by approx. 3 mm, as shown in Figure 4 (Note: This was the same wheel that was originally fitted on the RHS front of the vehicle, on which the AlloyGator had moved during Test 2).
- There was no movement to any of the AlloyGators fitted to the three other wheels.
- There was no loss in pressure to any of the tyres.

**Test 5 (day 2)**

This test was started with the AlloyGator on the LHS rear wheel in the same position to which it finished Test 4.

Upon completion of the test it was seen that:

- Part of the AlloyGator on the LHS rear wheel (with Pirelli P Zero tyre) had moved outwards by another 2 mm (approx.). This meant that during Tests 4 and 5 this AlloyGator had moved outwards by a total of 5mm (approx.). The AlloyGator is shown post-test in Figure 5. (Note: This was the same wheel that was originally fitted on the RHS front of the vehicle, on which the AlloyGator had moved during Test 2).
- There was no movement to any of the AlloyGators fitted to the other three wheels.
- There was no loss in pressure to any of the tyres.

**Conclusions**

- When an AlloyGator is fitted to a tyre that already has a damaged bead, it can highlight this problem as was observed during the preparation for Test 2.
- There was movement to the same AlloyGator during Tests 2, 4, and 5. The movement was always on the same wheel (same rim, fitted with the same Pirelli P Zero tyre). It occurred when the wheel was fitted to the RHS front (Test 2) of the car and also to the LHS rear (Tests 4 & 5) of the car.
- There was no loss of tyre pressure to any of the wheels fitted with AlloyGator rim protectors during the testing.

**Recommendations**

AlloyGator need to inspect the wheel (rim, tyre and AlloyGator) on which the AlloyGator rim protector moved in order to ascertain the reason why this movement occurred.

## Attachments



**Figure 1: An AlloyGator rim protector fitted to a wheel**



**Figure 2: Test vehicle with AlloyGator rim protectors fitted**



**Figure 3: Movement to the AlloyGator rim protector on the RHS front wheel following completion of Test 2**



**Figure 4: Movement to the AlloyGator on the LHS rear wheel following completion of Test 4**



**Figure 5: Total movement to the AlloyGator on the LHS rear wheel following completion of Tests 4 and 5**