

# EXHIBIT 14



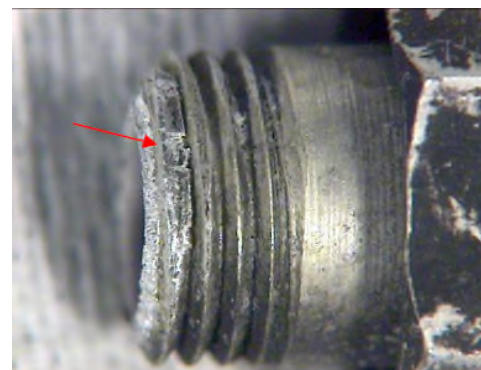
TPMS – Tire Guard Wheel Unit  
TG1B  
Mechanical cracks on valve stem

# Background

- Field returns showing longitudinal cracks or broken valve stems.



Longitudinal Cracks



Broken valve nose

Schrader has two suppliers for the heat treatment of the valve stem, each supplier use a different method for the thermal treatment. The thermal treatment is used to reinforce the mechanical properties of the aluminum.

## Suppliers for 2011 Alloy

- AHG with T4 thermal treatment
- Samat with T4 and T6 thermal treatment

SAMAT T6	AHG T4
Quenching at 505°C for 2 hours	Quenching at 493°C for 50 mn
Tempering at 160°C for 14 hours	Drying of parts
	Natural ageing (4 days minimum)



## DOE performed by Schrader

- A DOE was performed by Schrader to evaluate the performance of the different heat treatments used on the aluminum valves, the following variables were considered:.

Heat Treatment (T4, T6)  
 Aluminum (2011 or 6082)  
 Environmental conditions (Salt Fog, Immersion)  
 Cap presence (with or without)  
 Valve core torque (0.4 Nm, 1Nm, 1.2Nm)

- 2510 parts were used for the analysis, with the following distribution:

Supplier	Aluminum	Thermal Treatment	Environment		
			Salt Fog		Immersion
			With Cap	Without Cap	
SAMAT	6082	T6	545	90	40
SAMAT	2011	T6	435	90	20
SAMAT	2011	T4	655	90	20
AHG	2011	T4	435	90	

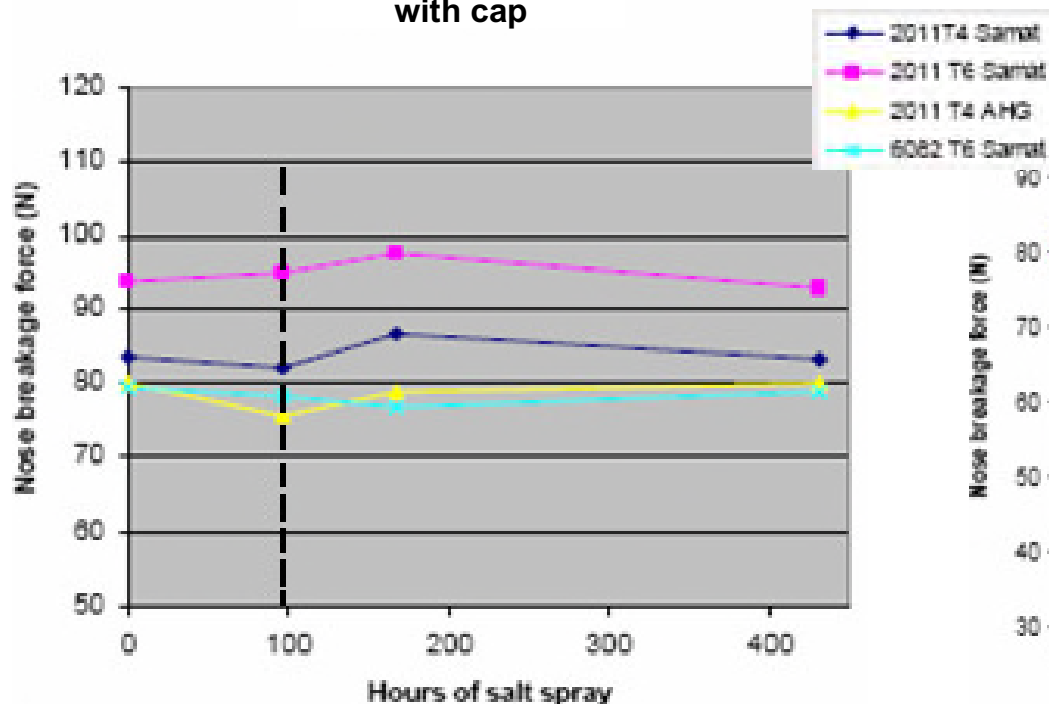
# Salt Spray + Nose Breakage Test

With and without CAP.

Valve core assembled **as per** Continental Specification **0.4 Nm**

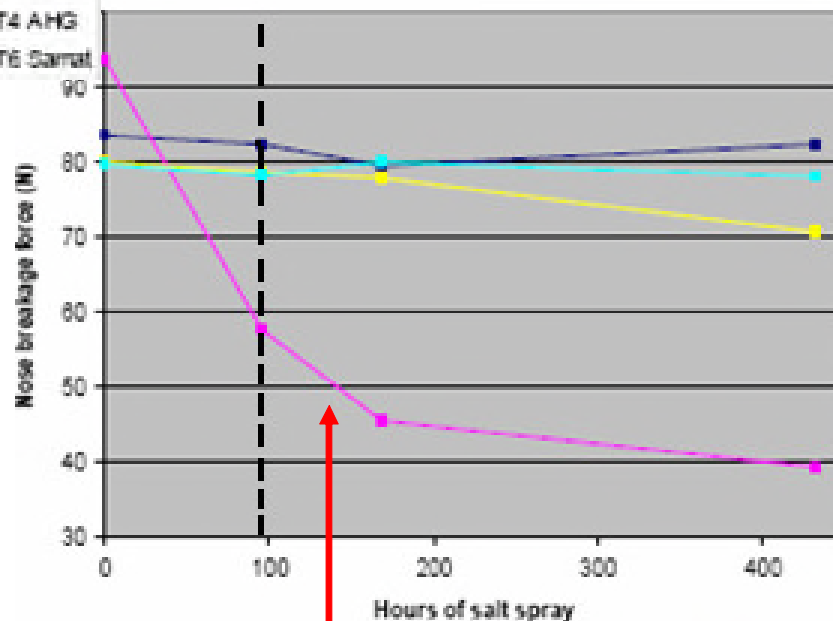
Nose breakage test performed on 10 parts each at 0, 96, 168 and > 400 hrs of exposure to the environment

**with cap**



**No change on the mechanical resistance**

**without cap**



After 400hrs of Salt Spray the valves with aluminum 2011 and **heat treatment T6** have **lost more than 50%** of their initial mechanical resistance.

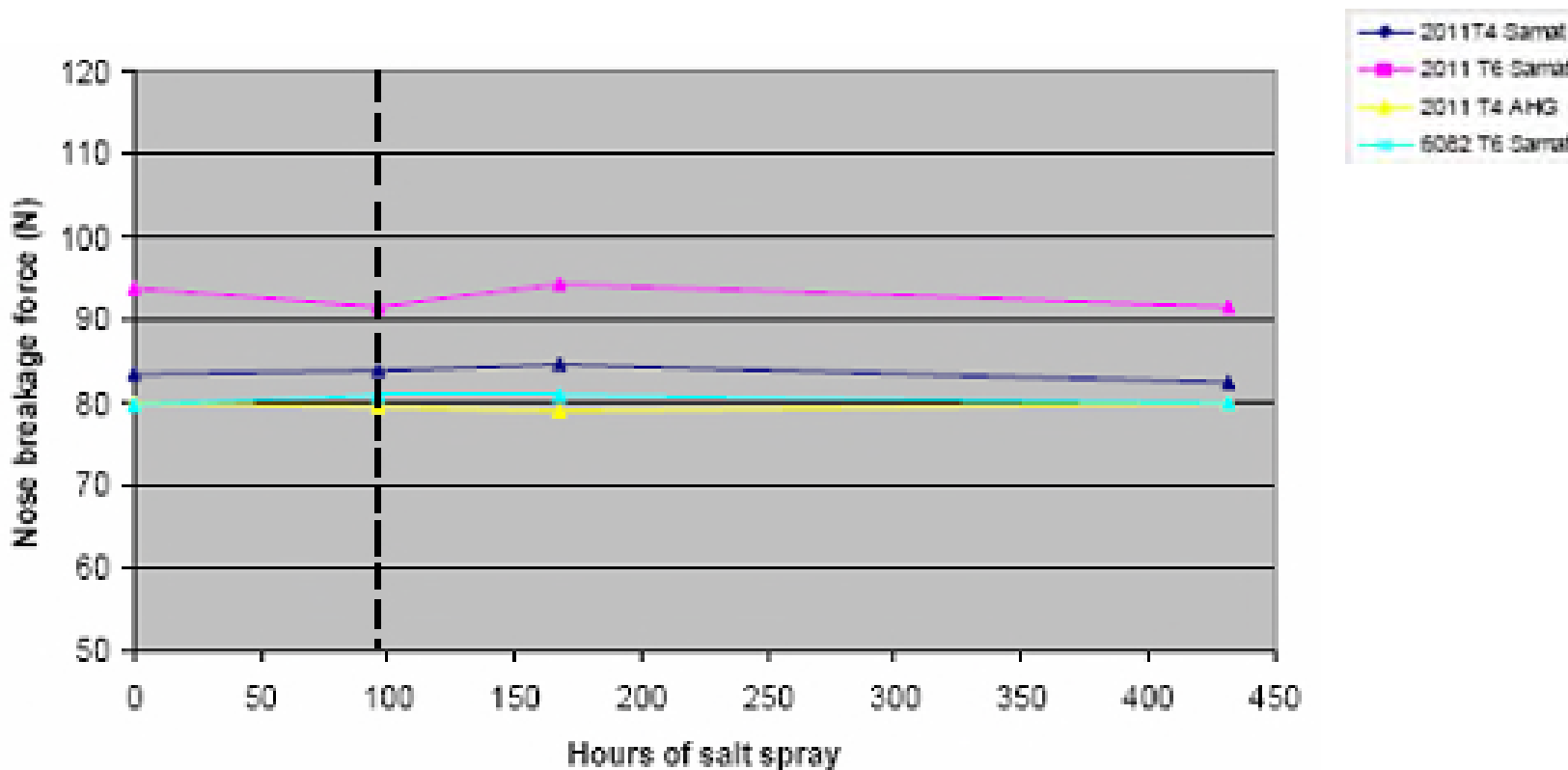


# Salt Spray + Nose Breakage Test

With cap.

Valve core assembled **outside** of Continental Specification **1 Nm**

Nose breakage test performed on 10 parts each at 0, 96, 168 and > 400 hrs of exposure to the environment



**No change on the mechanical resistance**

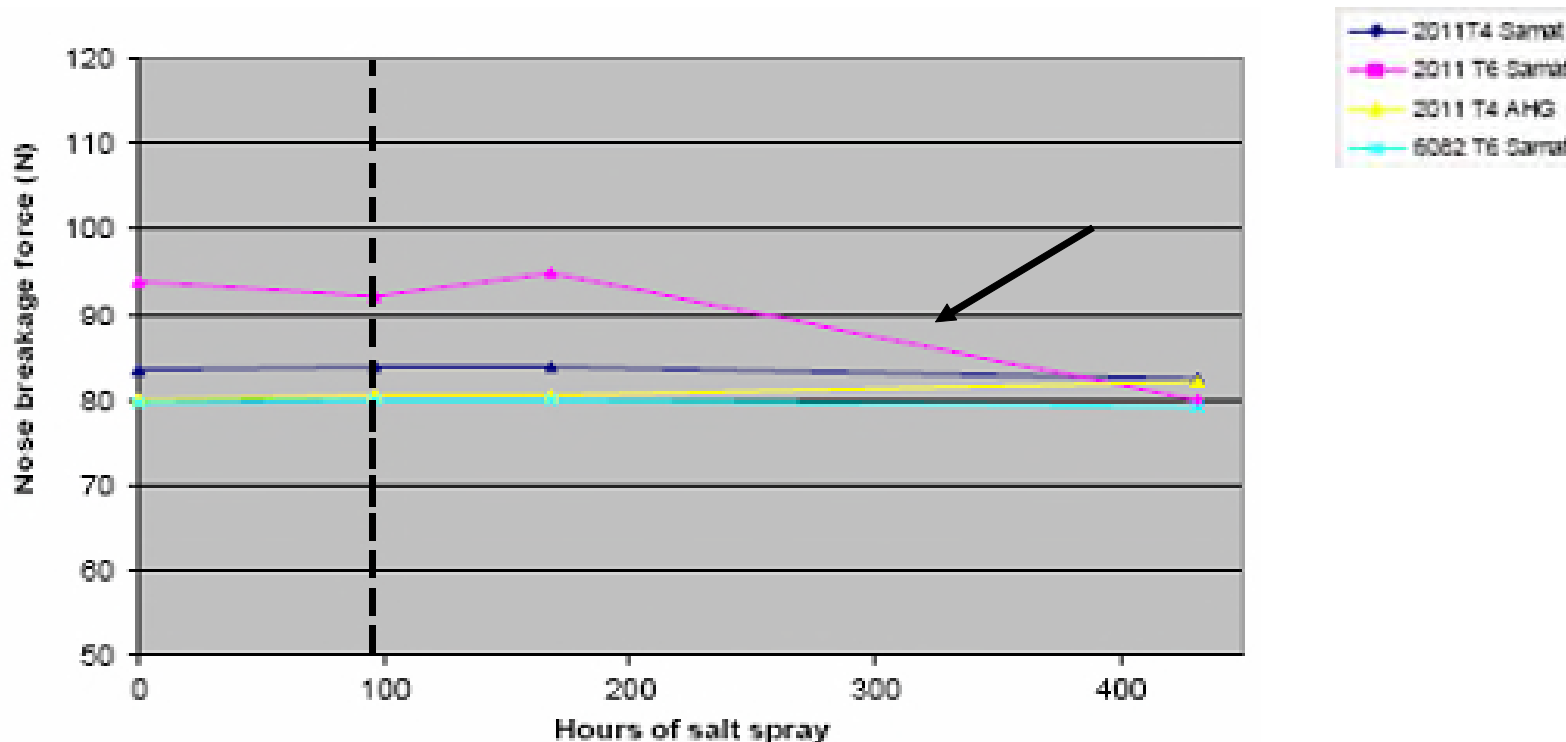


# Salt Spray + Nose Breakage Test

With cap.

Valve assembled **outside** of Continental Specification **1.2 Nm**

Nose breakage test performed on 10 parts each at 0, 96, 168 and > 400 hrs of exposure to the environment



After 400hrs of Salt Fog the valves with aluminum 2011 and heat treatment T6 shown a slight decrease ( $\approx 15\%$ ) of their initial mechanical resistance.

No change on the mechanical resistance of the other parts.



## Salt Spray + Nose Breakage Test

### ➤ Impact of the Torque (after 400hrs of exposure to salt spray).

Supplier	Aluminum	Thermal Treatment	Cap	Torque	Result
AHG	2011	T4	Yes	1.2Nm	No change on the mechanical resistance
SAMAT	2011	T4	Yes	1.2Nm	No change on the mechanical resistance
SAMAT	2011	T6	Yes	1 Nm	Slight decrease of the mechanical resistance ( $\approx 15\%$ )
SAMAT	6082	T6	Yes	1.2Nm	No change on the mechanical resistance

The aluminum 2011 with T6 had a slight decrease ( $\approx 15\%$ ) on the mechanical resistance after 400hrs of Salt Spray when tested with excessive torque

### ➤ Impact of the cap presence (after 400 hrs of exposure to salt spray).

Supplier	Aluminum	Thermal Treatment	Cap	Torque	Result
AHG	2011	T4	No	0.4 Nm	Slight decrease of the mechanical resistance ( $\approx 10\%$ )
SAMAT	2011	T4	No	0.4 Nm	No change on the mechanical resistance
SAMAT	2011	T6	No	0.4 Nm	<b>Severe decrease of the mechanical resistance (<math>&gt;50\%</math>)</b>
SAMAT	6082	T6	No	0.4 Nm	No change on the mechanical resistance

The aluminum 2011 with T6 lost more than  $>50\%$  of it's mechanical resistance after 400hrs of Salt Spray when tested without cap



# Immersion (10 parts per type)

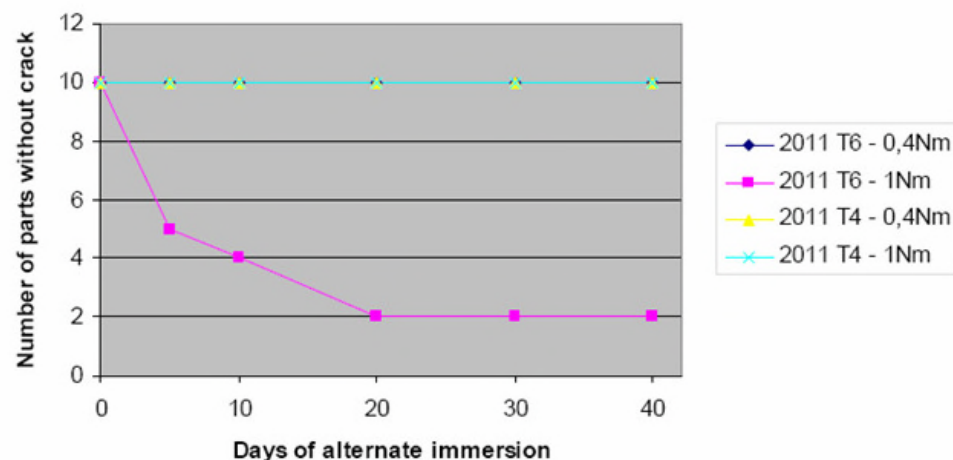
## ➤ Parts without cracks

Parts mounted with cap & valve core at 0.4Nm

Parts mounted with cap & with valve core change during the test (0.4Nm)

**SIMULATES TIRE CHANGE  
ACCORDING TO SPEC**

- 2011 T4 SAMAT
- 2011 T6 SAMAT



## ➤ Parts with cracks

Parts mounted with cap & valve core at 1 Nm - **3/5 defects**

Parts mounted with cap & with valve core changes at 1Nm or over – **5/5 defects**

**SIMULATES TIRE CHANGE  
OUT OF SPEC**

- 2011 T6 SAMAT

**Cracks were only found on the valves with Aluminum  
2011 with T6**

# Conclusions

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**No cracks or breaks will occur if the cap is in place and the valve core is screwed with a maximum of 0.4 Nm.**

➤ **Longitudinal cracks**

➤ None of the parts with Cap and the valve core screwed at 0.4 Nm showed cracks after 600 hours of salt spray.

➤ **Broken Nose**

➤ No specification available for the nose breakage test for TG1B. Another OEM spec for TG1C was used as a reference ( $\geq 70$  Nm).

➤ Results show that all parts with the cap and the valve core at 0.4 Nm are above 75 Nm after 400 hrs of salt spray.

➤ The influence of the presence of the cap can be clearly seen on the SAMAT T6 parts, a force of 40 Nm was required to break the valve nose after 400 hrs of exposure to salt spray without the cap.

## Recommendations

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- Stop aluminum 2011 with T6 thermal treatment and use only aluminum 2011 with T4 thermal treatment.
- Qualify aluminum 6082 (copper <0.1% - non susceptible to corrosion).
- Reevaluate validation requirements and define a more robust test procedure.