



Curmo, 13 December 2017

Messers

Via e-mail at [REDACTED]

**Re.: Brake master cylinder PPS**

Dear Sir or Madam,

Brembo S.p.A. has become aware of certain limited events regarding the front master cylinder and therefore recommends initiating a safety recall campaign.

We provide below the relevant information.

We request that you communicate the information set forth below as required by law. In your communications, please use the language set forth below. Any changes should be previously shared with Brembo S.p.A.. Brembo S.p.A. will not be responsible for any revisions not previously approved by us.

**Describe the defect or noncompliance:** or Crack generation on the front brake master cylinder PPS (polyphenilene sulphide) piston connecting the internal pressure area to the external surface. The consequence is that the front brake may not participate in stopping the bike properly. The rear brake is not affected and works correctly.

**Describe the safety risk:** If a crack through the piston occurs, the fracture connects the pressure chamber with the open air: in this condition the brake master cylinder is not able to generate enough pressure in the system and may reduce the braking system's effectiveness. As a result, braking can only be performed with the rear brake which may increase stopping distance significantly, which may increase the risk of injury to the rider and/or damage to property.

**Estimated percentage of product involved with defect:** 150 PPM (0,015 %) for all OEMs involved

**Describe the cause:** The anisotropy of the piston material, in addition to an unfavorable geometric distribution of porosity generated during the injection process, could lead to the failure of the component (crack generation) subject to stress typical of mission profiles such as: use of the vehicle on race tracks, frequent ABS interventions, or vehicle ground fall.

BREMBO S.p.A.

Sede legale

Sede amministrativa e uffici

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Identify any warning which can precede or occur: The failure may occur without any warning to the driver even though we cannot exclude a significant loss in brake effectiveness as an early symptom.

**Chronology of Defect / Noncompliance Determination**

- October 2016 - Brembo now realizes that the above described condition may have first occurred during vehicle track use. No injuries reported. Brembo commenced the failure investigation
- February 2017 - Since it was not possible to identify the failure mode during the investigation jointly conducted with the motorcycle manufacturer the investigation was concluded. Monitoring of the field has been agreed.
- June 2017 - A second field occurrence resulted in an investigation in which Brembo decided to introduce a preventative containment action on production replacing the PPS piston with an aluminium one (lead-time implementation of 2 months).
- October 2017 - Two additional field occurrences were reported (both on the motorbikes track). No injuries have been reported so far.
- November 2017 - Investigation closed: the root cause was identified as above (please refer to the "Describe the cause").
- December 2017 - Brembo decided to proceed with a world-wide safety recall campaign.

**Identify the Remedy**

Official dealers will replace the PPS piston with an aluminium one.

**Identify and describe how and when the recall condition was corrected in production**

The new piston is made from aluminium and machined from bar, guarantees a higher strength material as well as the absence of any possibility of porosity. This solution, already validated and in production for the past fifteen years, has proven to be fully reliable. In production line Brembo is now supplying the complete aluminium front brake master cylinder's piston since September 2017.

**Contact of reference**

[Redacted]

Yours sincerely,

Brembo S.p.A.

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Brembo S.p.A.

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