

# Update on investigation results

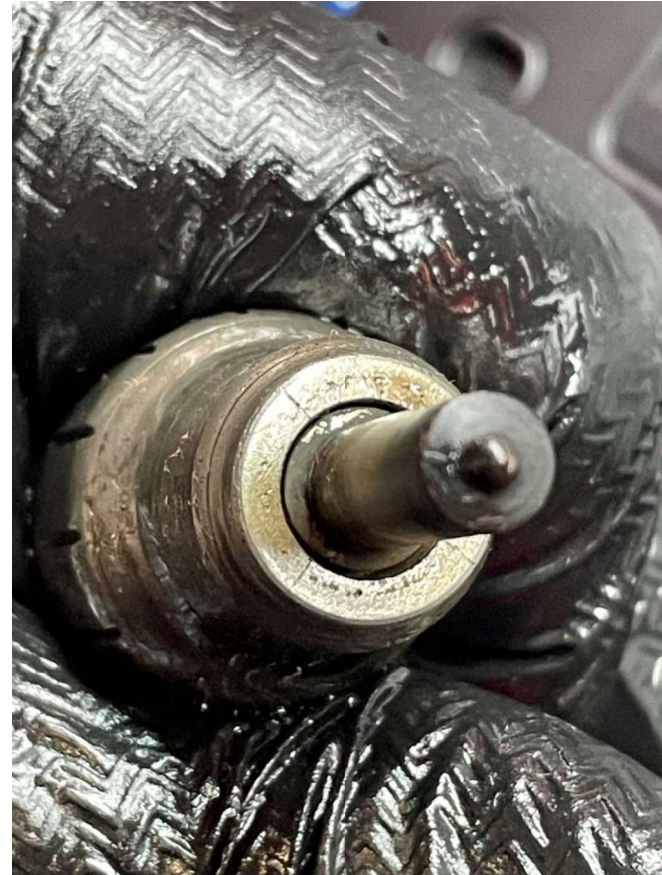
## Overview of the Remanufacturing Process

- Injectors are completely torn down and ran through multiple washing processes.
- All of the injector components are kept together.
- The DMV25 (amplifier) needle and seat are re-ground.
- All parts are visually inspected. Spring tensions are checked. O-rings are replaced. Coil resistance is checked.
- Every injector is then ran through a 6 point flow test on a calibration machine using the same specs Bosch uses. They are tested up to 1400 bar and fuel quantity is measured in cubic microns.
- If the injector fails, it will go to re-work. This may involve additional component replacement or grinding work on the DMV24 (needle valve).
- Injectors must pass the calibration test before they are serialized and packaged.

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## Cracked Cap Nuts

- Occasionally we see recently installed reman injectors cause a pinging noise that wasn't there before. We have found the cap nuts cracked. This is being missed during the remanufacturing process.
- On 6/10/24 reman issued a quality alert to their teams with the photo shown.
- Reman will investigate other methods to identify these cracks beyond a visual inspection.



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# Cracked Nozzles

- Three sets of reman injectors which experienced early life failure were sent to Bosch in Charleston for analysis. All three found a single injector with a crack at the shoulder of the nozzle. Additional sets are being analyzed.

## **1<sup>st</sup> 6 pack of injectors**

Mileage at time of failure – 16,565

Injectors replaced for overfueling (fuel found in EGR hot pipe)

## **2<sup>nd</sup> 6 pack of injectors**

Mileage at time of failure – 2,557

Injectors replaced for DPF Overtemp Faults

## **Single injector**

Mileage at time of failure – 6,190

Injectors replaced for DPF overtemp and engine smoothness faults

**UPDATE since our report out in July:**

**- Reman has approved moving to 100% new injector nozzles to prevent the cracking issue.**

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