

Advancing Diesel Particulate Filter Maintenance: A Comprehensive Case Study of BAC101 DPF Cleaning Solution on 136 Vehicles Over Two Years

Abstract

This extensive case study delves into the effectiveness of BAC101, a cutting-edge Diesel Particulate Filter (DPF) cleaning solution, following rigorous testing on 136 vehicles during a two-year period. These vehicles encompassed passenger road vehicles, light commercial vehicles, and trucks, and were tested across multiple locations in the UK, Germany, and Australia. Special emissions testing was conducted at the esteemed Millbrook Proving Ground in England, an official testing facility for OEM manufacturers. The study focused on the 2021 Ford Ranger, 2018 Scania R450, and 2019 Renault Traffic, revealing significant improvements in DPF blockage reduction and vehicle performance after treatment with BAC101. Additionally, this study explores the unique two-part cleaning system employed by BAC101, targeting soot, ash, carbon, and oil within the entire DPF unit. Notably, 41 totally blocked DPF units removed from vehicles deemed beyond repair by dealers and workshops were submerged in BAC101 solutions, with remarkable results. Of these 41 units, 37 were successfully cleaned and restored to operational conditions, showcasing the remarkable capabilities of BAC101. The study concludes that BAC101's two-part cleaning system offers an impressive 95% success rate in clearing DPF blockages, potentially transforming DPF maintenance in the automotive industry.

- Introduction

With a growing emphasis on emissions reduction and environmental responsibility, Diesel Particulate Filters (DPFs) play a pivotal role in mitigating harmful emissions from diesel engines. However, over time, DPFs become clogged, resulting in diminished engine performance, increased fuel consumption, and emissions surpassing regulatory limits.

BAC101 is an innovative DPF cleaning solution designed to address these challenges, aiming to restore DPFs to peak operating condition. What sets BAC101 apart from conventional cleaning solutions is its two-part cleaning system, which comprehensively targets soot, ash, carbon, and oil deposits, cleansing the entire DPF unit. This case study investigates the efficacy of BAC101 on 136 vehicles tested across three countries over two years.

- Methodology

2.1. Vehicle Selection and Testing Locations

This study included 136 vehicles selected from the UK, Germany, and Australia. These vehicles represented a diverse range, from passenger cars to light commercial vehicles and trucks. The testing process was carried out under real-world conditions, with a specific focus on conducting "live" emissions testing in March and June 2023 at the Millbrook Proving Ground, recognized as an official testing facility for OEM manufacturers.

2.2. Emissions Testing Procedure

Special emissions testing was executed using a portable emissions measurement system (PEMS) to measure exhaust emissions before and after DPF cleaning. The study primarily concentrated on the following vehicles:

- 2021 Ford Ranger
- 2018 Scania R450
- 2019 Renault Traffic

For each vehicle, emissions measurements were obtained both before and after the DPF cleaning process. The key emissions parameters monitored included:

- Particulate matter (PM) emissions
- Nitrogen oxide (NO_x) emissions
- Carbon monoxide (CO) emissions
- Hydrocarbon (HC) emissions

2.3. DPF Cleaning Process

The DPF cleaning process involved the application of the BAC101 cleaning solution, which incorporates a two-part cleaning system for comprehensive DPF maintenance. The two stages of cleaning were as follows:

Stage 1: Preliminary Cleaning

- Application of BAC101 cleaning solution to the DPF
- Allowing the solution to react with accumulated deposits
- Rinsing to remove loosened debris

Stage 2: Deep Cleaning

- A second application of BAC101 for thorough cleaning
- High-pressure air or water flush to remove remaining contaminants
- Reinstallation of the cleaned DPF unit in the vehicle

2.4. Evaluation of Blocked DPF Units

This study also investigated the efficacy of BAC101 on blocked DPF units removed from vehicles that were deemed beyond repair by dealers or workshops. A total of 41 such DPF units were submerged in BAC101 solutions for a period of 2 hours each. The results were categorized as follows:

- 37 DPF units were successfully cleaned and restored to operational conditions.

- 3 DPF units were cleaned of contaminants but exhibited sidewall damage due to excessive use with blockages.
- 1 DPF unit was beyond repair.
- Results

3.1. Ford Ranger 2021

The 2021 Ford Ranger displayed a remarkable 76% reduction in DPF blockage after undergoing the BAC101 treatment. Emissions testing demonstrated substantial improvements in all parameters:

- PM emissions reduced by 78%
- NOx emissions decreased by 61%
- CO emissions lowered by 67%
- HC emissions reduced by 72%

Furthermore, the Ford Ranger's engine performance exhibited notable enhancements, with improved power delivery and fuel efficiency.

3.2. Scania R450 2018

Prior to the DPF cleaning, the 2018 Scania R450 experienced reduced power output due to DPF blockage. However, following the two-stage BAC101 cleaning process, the vehicle's engine performance was fully restored, with no significant emissions concerns. These results indicated that BAC101 effectively removed blockages and enhanced the Scania R450's efficiency.

3.3. Renault Traffic 2019

The 2019 Renault Traffic was in limp mode due to a completely blocked DPF. After treatment with BAC101, the vehicle not only exited limp mode but also exhibited full power delivery. Emissions testing showed substantial improvements:

- PM emissions reduced by 84%
- NOx emissions decreased by 71%
- CO emissions lowered by 76%
- HC emissions reduced by 79%

These findings underscore the exceptional capabilities of BAC101's two-part cleaning system in restoring even severely blocked DPFs.

3.4. Blocked DPF Units

The evaluation of 41 blocked DPF units submerged in BAC101 solutions yielded remarkable results. Of these units, 37 were successfully cleaned and restored to operational conditions, while 3 units were cleaned of contaminants but had sidewall damage due to excessive use with blockages. One unit was beyond hope of any repair. This demonstrates BAC101's potential to rejuvenate DPF units previously considered unsalvageable.

- **The BAC101 Two-Part Cleaning System**

BAC101's standout feature is its two-part cleaning system, which differentiates it from other DPF cleaning solutions. While many products primarily focus on carbon deposits, BAC101 adopts a holistic approach to DPF cleaning. The two-stage process is designed to target and remove the following contaminants:

4.1. Soot and Carbon Deposits

Stage 1 of the cleaning process involves applying the BAC101 cleaning solution to break down and remove soot and carbon deposits. These fine particulates commonly clog DPFs and lead to reduced engine performance and increased emissions. BAC101 effectively eliminates these contaminants, restoring the DPF's filtration capacity.

4.2. Ash Accumulation

Ash buildup within the DPF can pose a significant challenge, especially in high-mileage vehicles. Ash is often resistant to traditional cleaning methods, but BAC101's second stage is dedicated to ash removal. The deep cleaning process effectively dissolves and flushes out ash deposits, ensuring optimal DPF performance.

4.3. Oil Residue

Oil deposits within the DPF can result from engine oil consumption or leakage. Over time, oil residues accumulate and contribute to DPF blockage. The BAC101 two-part cleaning system employs a targeted approach to oil removal, ensuring the DPF is free from oil-related contaminants.

- **Discussion**

The results of this extensive two-year testing of BAC101 on 136 vehicles in the UK, Germany, and Australia, coupled with specialized emissions testing at the Millbrook Proving Ground, illustrate the exceptional effectiveness of the BAC101 DPF cleaning solution.

The BAC101 two-part cleaning system, addressing soot, ash, carbon, and oil deposits, has proven to be a game-changer in DPF maintenance. The findings reveal a remarkable 95% success rate in clearing DPF blockages. Notably, the testing on the 2021 Ford Ranger, 2018 Scania R450, and 2019 Renault Traffic showcased substantial reductions in DPF blockage and remarkable improvements in engine performance.

Furthermore, the evaluation of 41 totally blocked DPF units, previously considered irreparable, submerged in BAC101 solutions demonstrated the transformative potential of this cleaning solution. The ability to restore 37 out of 41 units to operational conditions highlights the remarkable capabilities of BAC101 in rescuing DPFs that were previously considered beyond repair.

- **Conclusion**

This comprehensive case study underscores the exceptional performance of the BAC101 DPF cleaning solution when applied to 136 vehicles over a two-year period. The testing, conducted in the UK, Germany, and Australia, with specialized emissions testing at the Millbrook Proving Ground, highlighted the remarkable effectiveness of BAC101 in DPF maintenance.

The BAC101 two-part cleaning system, addressing soot, ash, carbon, and oil deposits, has proven to be a transformative approach to DPF cleaning. The case study findings indicate that this two-part system offers an impressive 95% success rate in clearing DPF blockages. Notably, the testing on the 2021 Ford Ranger, 2018 Scania R450, and 2019 Renault Traffic showcased significant reductions in DPF blockage and remarkable improvements in engine performance.

Furthermore, the successful restoration of 37 out of 41 totally blocked DPF units submerged in BAC101 solutions demonstrates the remarkable capabilities of this innovative cleaning solution. BAC101's potential to revive DPFs that were previously considered beyond repair holds promise for DPF maintenance in the automotive industry.

This study concludes that BAC101 represents a significant advancement in DPF maintenance and offers an environmentally responsible solution for reducing emissions and enhancing the performance and longevity of DPF-equipped vehicles. Further research and field applications will continue to refine and validate the efficacy of this groundbreaking cleaning solution in the automotive industry.

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