# Evaluation of Diesel Injector & DPF Flush on Engine Torque and Power in a Dodge Ram 2500 Pickup

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POWER SERVICE PS® Diesel Additives

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## Abstract

Accumulation of fuel injector deposits in high pressure common rail diesel engines compromises spray patterns, slows down fuel vaporization, and eventually degrades peak torque and horsepower. This evaluation assessed the performance recovery of an in-service light-duty pickup truck treated with Power Service Diesel Injector & DPF Flush at a 1:500 treatment ratio. The truck was a 2019 Ram 2500 powered by a 6.7L Cummins turbo-diesel with approximately 60,000 miles. Hub-mounted chassis dynamometer benchmarking across a six-tank treatment cycle demonstrated an average **+8.1% gain in peak torque** (climbing from 602.5 lb-ft to 651.3 lb-ft) and an average **+8.5% increase in peak horsepower** (rising from 323 HP to 351 HP). These results confirm that removing stubborn carbon and internal diesel injector deposits (IDIDs) from injector nozzles restores cylinder pressure generation, returning lost power to diesel engines.


## Introduction

Modern diesel engines rely on extremely precise injector tips operating under high pressures to spray fuel into a microscopic, rapidly combustible mist. Over tens of thousands of miles, thermal exposure and heavy duty cycles cause deposits to bake onto injector surfaces. This results in external tip coking and IDID formation.

When injector nozzles become fouled, the spray pattern distorts, delivering heavy, coarse fuel droplets instead of a fine mist. Larger droplets ignite inconsistently and burn late into the power stroke, resulting in delayed heat release and elevated exhaust gas temperatures (EGTs). Drivers notice this as reduced pulling force, delayed throttle response, and lost towing power. Utilizing a concentrated chemical treatment such as Diesel Injector & DPF Flush dissolves these stubborn deposits during regular driving, clearing the fuel path and restoring factory engine response.

## Materials and Methods

### 1. TEST EQUIPMENT (MATERIALS)

- **Test Platform:** 2019 Ram 2500 pickup.
- **Engine:** 6.7L Cummins turbocharged inline-6 diesel.
- **Service History:** Real-world field service of approximately 60,000 accumulated miles showing typical injector wear and fouling.
- **Treatment Chemistry:** Diesel Injector & DPF Flush at a 1:500 treatment ratio

### 2. DYNAMOMETER CONFIGURATION AND TEST PROTOCOL

- **Dynamometer Platform:** Dynapack Hub-Mounted Chassis Dynamometer
- **Test Procedure:** Wide-open throttle (WOT) engine RPM sweeps executed from 1,500 to 3,000 RPM.
- **Gear Selection:** All dynamometer pulls were locked in 4th gear to maintain a direct transmission ratio and avoid downshift torque multiplication anomalies.
- **Data Standardization:** Torque and horsepower figures were corrected for barometric pressure, ambient temperature, and humidity in accordance with SAE J1349 (rev. 2004) engine power test code standards.
- **Evaluation Interval:** Baseline runs were conducted with the vehicle in its fouled state. Identical benchmark sweeps were performed after completing a six-tank clean-up cycle under typical driving and towing duty cycles. Coolant, engine oil, and transmission fluid temperatures were stabilized within standard operating ranges prior to each pull.

## Results

Fuel treatment with Diesel Injector & DPF Flush delivered consistent, statistically significant recovery across the entire engine operating sweep.

| Parameter | Baseline (Fouled) | Post-Treatment | Net Recovery | Total Gain | Test Duration |
|---|---|---|---|---|---|
| **Peak Torque (Average)** | 602.5 lb-ft | 651.3 lb-ft | +48.8 lb-ft | **+8.1%** | 6 Fuel Tanks |
| **Peak Horsepower (Average)** | 323 HP | 351 HP | +27 HP | **+8.5%** | 6 Fuel Tanks |

- Average peak torque climbed by nearly 49 lb-ft, providing a direct **+8.1% increase** in rotational force.
- Average peak horsepower increased by **+8.5%,** returning 27 HP back to the driveline.
- Horsepower and torque climbed together, proving the engine recovered its strength across the entire driving range.

## Discussion

The simultaneous recovery of +8.1% torque and +8.5% horsepower underlines how sensitive modern diesel injection events are to nozzle cleanliness:

1. **Restored Atomization Dynamics:** Clearing carbonaceous deposits from nozzle tips allows fuel to spray as a fine, uniform cloud. This enables instant fuel-air mixing, shortening ignition lag and ensuring faster initial combustion.
2. **Synchronized Cylinder Pressure:** Clean injection patterns allow fuel to burn precisely when the piston sits at top dead center. Maximizing cylinder pressure at the start of the expansion stroke converts fuel energy into immediate rotational torque rather than lost through the exhaust.
3. **Smooth Internal Movement:** The detergent cleans internal needle surfaces and command valves, eliminating sticking. Restoring rapid mechanical response ensures that the correct fuel volume enters the chamber at the proper time.

## Conclusion

Running Diesel Injector & DPF Flush provides a proven, non-mechanical solution for reversing deposit-related performance losses in light- and medium-duty diesel trucks. For vehicles displaying sluggish acceleration, lost towing strength, or high mileage accumulation:

1. **Add to Tank:** Introduce Diesel Injector & DPF Flush directly into the fuel tank prior to refueling to ensure thorough mixing at the recommended 1:500 treatment ratio.
2. **Clean-Up Cycles:** Operate the vehicle through normal hauling, highway, and daily driving duties across consecutive tank fills to allow the active detergents to dissolve internal and external deposits.
3. **Performance Verification:** Validate recovery through stronger throttle response, improved grade pulling under load, and reduced engine strain during acceleration.

**ABOUT THE AUTHOR**

## Jessica Crabtree, BS Chemistry (ACS Certified)

Jessica is the Director of Technical Services at Power Service Diesel Additives with 12 years of experience in fuel system performance and maintenance. By analyzing over 2,000 fuel samples annually, she provides unique, data-backed insights into real-world fuel quality and equipment longevity. An active member of ASTM Committee D02, she leverages her deep technical background to help fleet managers optimize fuel efficiency, reduce maintenance costs, and ensure reliability in varying regional fuel conditions.