



# ENGINEERING REPORT

2021+ FORD BRONCO 2.3L INTAKE | SKU: MMAI-BR23-21

By Ye Liu, *Mishimoto Product Engineer*

## REPORT AT A GLANCE

- **Goal:** Create a direct-fit, high-quality intake for the 2021+ Ford Bronco 2.3L EcoBoost.
- **Results:** The Mishimoto performance intake showed 29% less restriction on the flow bench than the stock intake.
- **Conclusion:** The Mishimoto performance intake is an ideal bolt-on upgrade for 2021+ Ford Bronco 2.3L EcoBoost owners looking for airflow improvements and increased induction sound.

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DESIGN OBJECTIVES

The design requirements assigned to this project are as follows:

- Improve airflow while maintaining a safe air/fuel ratio without custom tuning
- Durable design that will last the lifetime of the vehicle
- Easy bolt-on installation without any permanent modifications
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- High-quality intake tone
- Compatible with Borne Off-Road snorkel
- Robust for off-road applications

MATERIAL SELECTION

The material used for the rotational-molded airbox and intake tube is XLPE (Cross-Linked Polyethylene) plastic. XLPE material demonstrates high-impact strength, excellent heat resistance, and is UV-stable. The flexible grommets that connect the intake tubes to the two airboxes are made of injection-molded silicone rubber that can withstand engine bay heat up to 350°F. In addition, the silicone intake tube offers excellent fuel and oil resistance compared to its OEM counterpart.

DESIGN AND FITMENTS

Our design process started with taking the stock intake apart, thoroughly investigating the system, and searching for possible improvements. The Bronco 2.3L EcoBoost engine has a single turbo, whereas the 2.7L is a twin-turbo platform. Ford cleverly designed these intake systems by having both intakes share the same air cleaner housing design, with a different bolt-on flange that adapts to different intake pipes. Our intake R&D process for both Bronco intakes happened in tandem with each other, just like how Ford developed the two Broncos. The Mishimoto design utilizes the same concept by sharing the airbox and filter element across the two platforms.

The Mishimoto airbox houses an oversized conical air filter with a 4.5-inch inlet diameter and features a clear window on the airbox lid to conveniently inspect the filter. The topside opening covered by the clear lid also doubles as the air inlet port for the Borne Off-Road snorkel system, which is designed to be a modular add-on to the intake. The Mishimoto intake tube eliminates the corrugated section on the stock tube to maximize airflow and is secured to the airbox with our patent-pending grommet design. This design provides a reliable and flexible connection between the airbox and the intake tube, which is crucial to the integrity and longevity of

the intake system on any off-road vehicle where engine movements can be sudden and aggressive.



FIGURE 1: Stock Intake

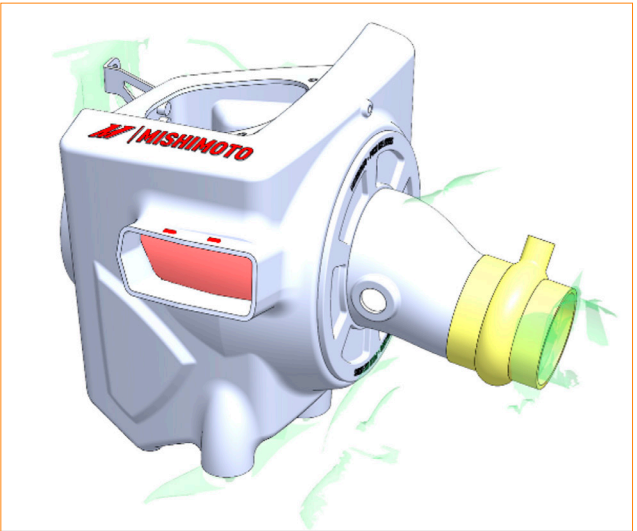


FIGURE 2: Mishimoto Intake 3D Design



SOUND TESTING

The Mishimoto performance intake provides a louder and deeper intake tone that is pleasing to the ear while improving the turbo spool sound.

PERFORMANCE TESTING

The Mishimoto intake demonstrated a 29% decrease in restriction compared to the stock intake.

We also installed the 3D-printed intake prototype on our R&D vehicle and conducted complete performance testing on our in-house DynaPack chassis dynamometer. With Bronco's MAP-based stock tune, the Mishimoto intake showed identical horsepower and torque numbers to the stock intake. Custom tuning and additional engine upgrades will be required to fully tap into the airflow potential provided by the Mishimoto performance intake.

INSTALLATION NOTES

The Mishimoto performance air intake for the 2021+ Ford Bronco 2.3L EcoBoost is a direct-fit upgrade that is safe to run on the stock tune and requires no permanent modification.

Ye Liu  
Product Engineer, Mishimoto Automotive

2021 FORD BRONCO 2.3L PERFORMANCE AIR INTAKE  
FLOW BENCH TEST - MISHIMOTO VS STOCK

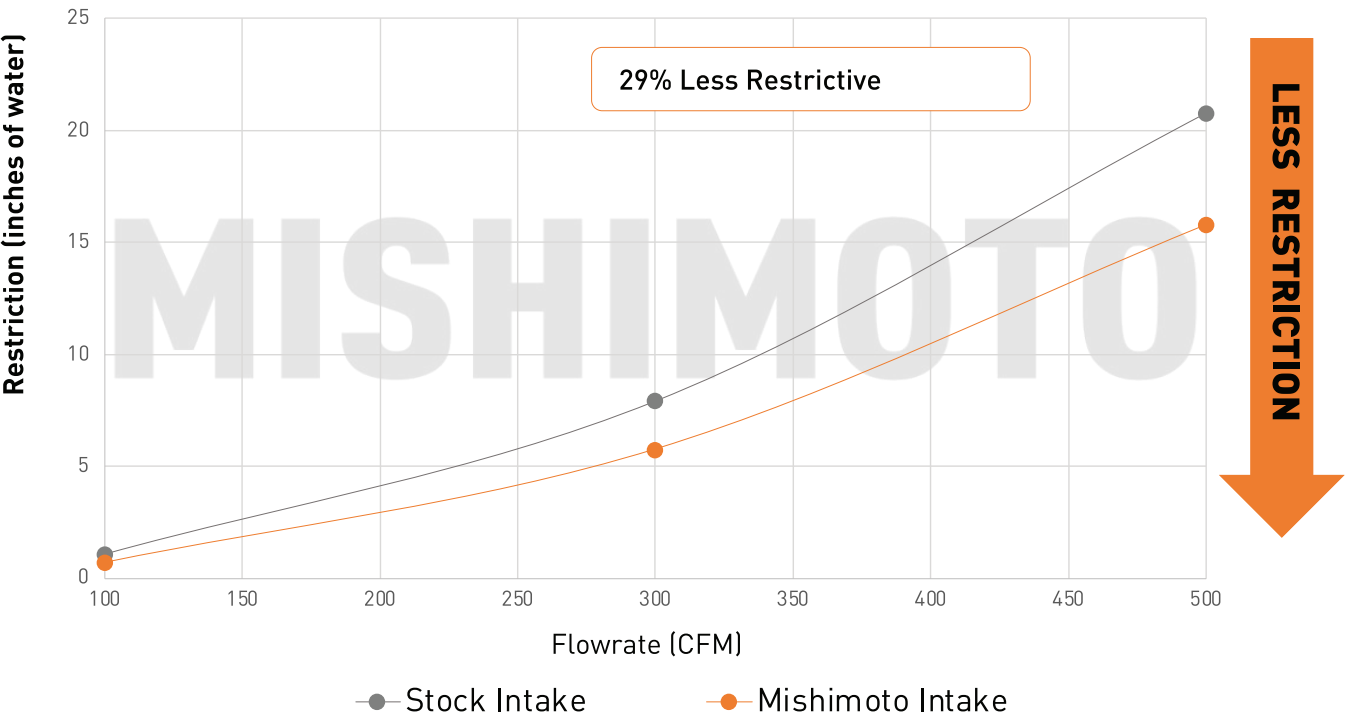


FIGURE 1: Flow bench Comparison chart

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