



ENGINEERING REPORT

2021+ Ford Bronco 2.7L EcoBoost Intake | SKU: MMAI-BR27-21

By: Ye Liu, *Mishimoto Product Engineer*

REPORT AT A GLANCE

- **Goal:** Create a direct-fit, high-quality intake for the 2021+ Ford Bronco 2.7L EcoBoost.
- **Results:** The Mishimoto performance intake reduced air restriction by 39.6% over the stock intake system. This improvement in flow resulted in dyno-proven gains of up to 7.5 HP and 7.4 lb-ft of torque on a stock-tuned Bronco 2.7L.
- **Conclusion:** The Mishimoto performance intake is an ideal bolt-on upgrade for 2021+ Ford Bronco owners looking for airflow improvements, increased induction sound, and performance gains.

CONTENTS

PG	2	DESIGN OBJECTIVES
		MATERIAL SELECTION
		DESIGN & FITMENT
PG	3	SOUND TESTING
PG	4	PERFORMANCE TESTING
		INSTALLATION NOTES

DESIGN OBJECTIVES

- 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
- 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 counterparts.

DESIGN AND FITMENT

Our design process started with taking the stock intake apart, thoroughly investigating the system, and searching for possible improvements. The Bronco 2.3L engine has a single turbo, whereas



Figure 2: Mishimoto Intake Production Sample Installed

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, designed to be a modular add-on system to the intake.

With a twin-turbo system, the 2.7L stock intake airbox has a bolt-on flange that splits airflow into two separate streams that feed to each turbo located on opposite sides of the engine bay. The Mishimoto intake replaces this part with a more streamlined design to maximize and distribute airflow more evenly into the turbos. In addition, the “splitter” section of the Mishimoto intake tube 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. A longer intake tube connects the splitter tube to the far side turbo and improves the internal cross-sectional area by 20% compared to the stock tube.

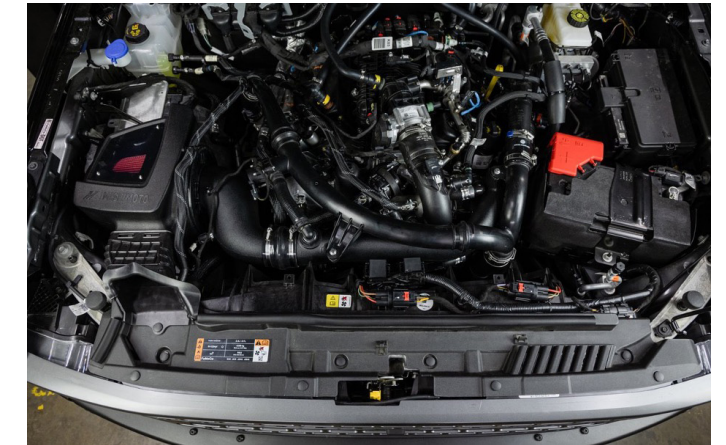


Figure 3: Mishimoto Intake Production Sample Installed

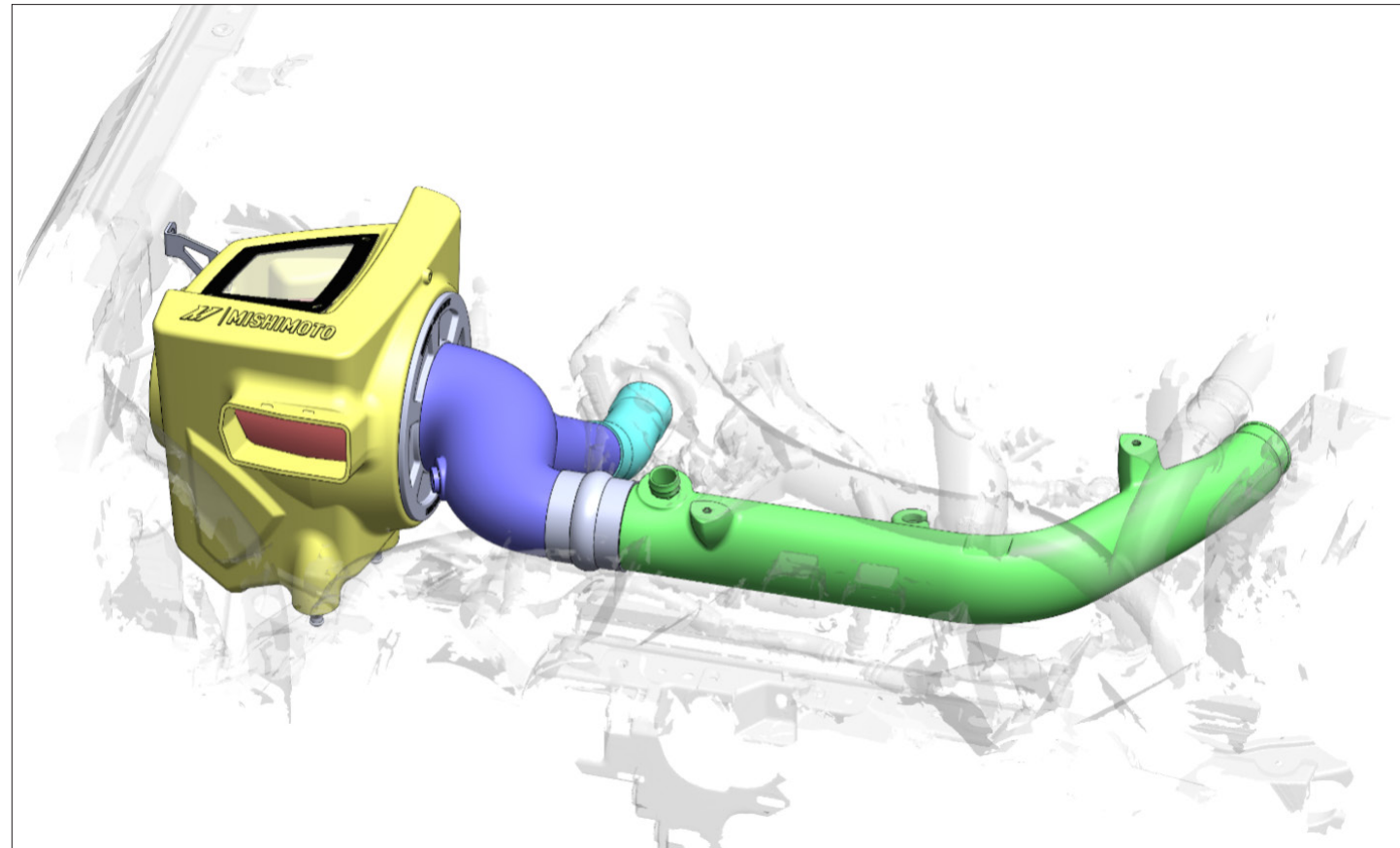


Figure 1: Mishimoto Intake 3D Design

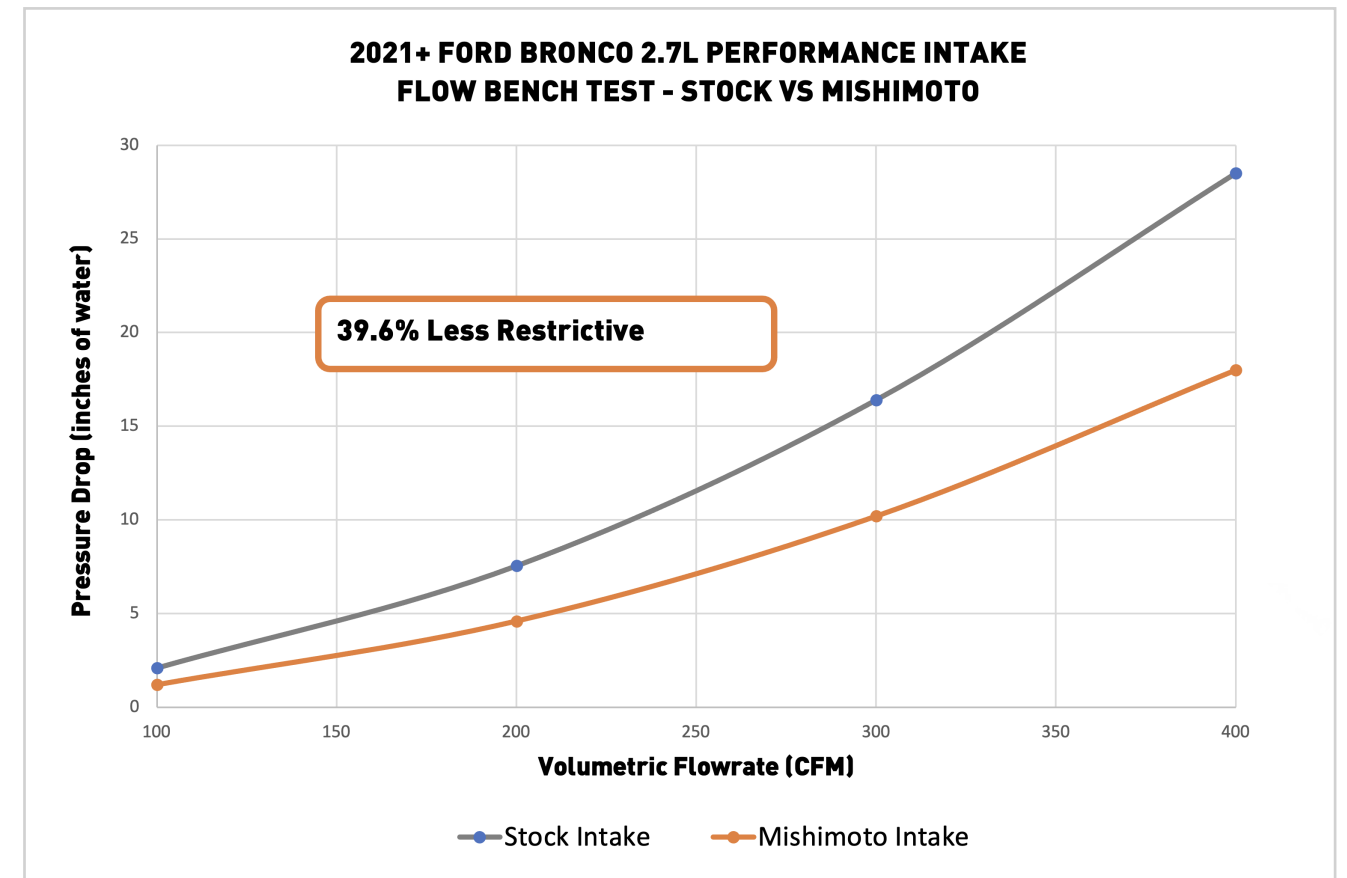


Figure 4: Flow Bench Comparison Chart

SOUND TESTING

The Mishimoto performance intake provides a louder and deeper intake tone while improving the turbo spool sound.

PERFORMANCE TESTING

The Mishimoto performance intake reduced air restriction by 39.6% over the stock intake system. This improvement in flow resulted in dyno-proven gains of up to 7.5 HP and 7.4 lb-ft of torque on a stock-tuned Bronco 2.7L.

INSTALLATION NOTES

The Mishimoto performance air intake for the 2021+ Ford Bronco 2.7L EcoBoost is a direct-fit upgrade that is safe to run on the stock tune and requires no permanent modification.

TESTING DONE BY:



Ye Liu, Mishimoto Product Engineer

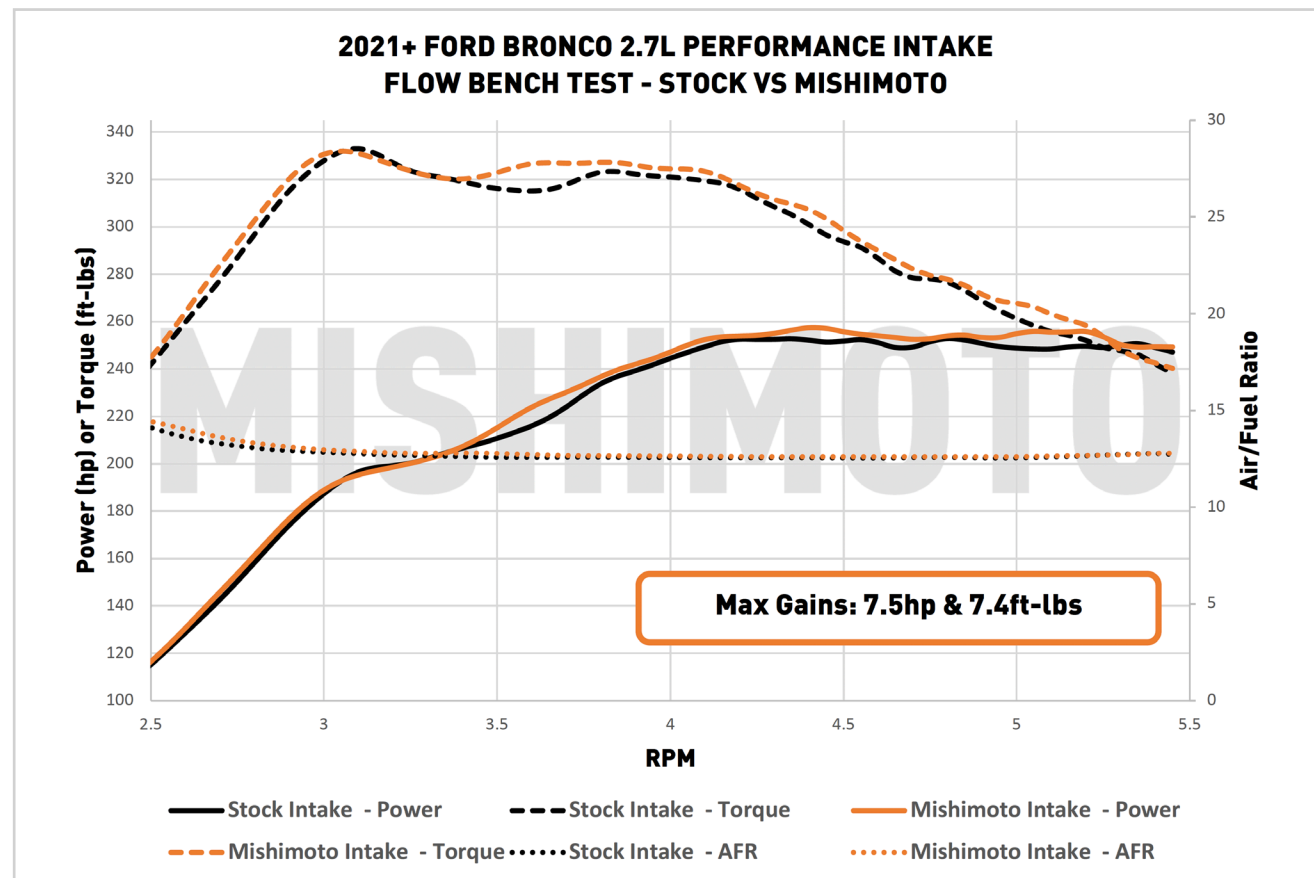


Figure 5: Dyno Results

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