



# ENGINEERING REPORT

2022+ Subaru WRX Intake | SKU: MMAI-WRX-22

By: Ye Liu, *Mishimoto Product Engineer*

## REPORT AT A GLANCE

- **Goal:** Create a direct-fit, high-quality intake for the 2022+ Subaru WRX.
- **Results:** The Mishimoto performance intake reduced air restriction by 75.4% over the stock intake system. This improvement in flow resulted in dyno-proven gains of up to 13.3 HP and 16.6 lb-ft of torque on a stock-tuned WRX.
- **Conclusion:** The Mishimoto performance intake is an ideal bolt-on upgrade for 2022+ Subaru WRX owners looking for airflow improvements, increased induction sound, and performance gains.

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## 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

## MATERIAL SELECTION

This intake kit consists of a mandrel-bent aluminum intake pipe, CNC-machined MAF housing, a silicone coupler, and a powder-coated steel heat shield with a clear polycarbonate lid.

## DESIGN AND FITMENT

Our design process started with taking the stock intake apart, thoroughly investigating the system, and searching for possible improvements. The air intake design for the WRX platform has largely remained unchanged throughout the years. A wide duct scoops fresh air fed through the grille and radiator cover, guiding it to a compact

air cleaner housing with a panel filter inside. The new 2022+ WRX continues to use a Mass Air Flow based strategy, with the MAF sensor located on the rear half of the air cleaner housing. With the MAF housing and turbo inlet both positioned parallel to the ground but facing the opposite direction, metered air must pass through a long intake tube with two 90-degree bends to reach the turbo.



Figure 2: Stock Intake Tube



Figure 1: Stock Intake Airbox

Based on these observations, we have identified two main areas where we can dramatically improve airflow - first, increasing the airbox and air filter size, and second, reducing the length and bends of the intake tube. With these goals in mind, we first created an intake tube that connects the turbo inlet and air filter in the most flow-efficient fashion, with only one bend in the pipe. The short straight coupler used to adapt the turbo inlet to the 3-inch aluminum pipe has built-in velocity stack geometry that matches the turbo inlet inside diameter for smoother airflow into the turbo. A CNC-machined, dyno-calibrated MAF housing is welded to the top end of the intake tube. A partially enclosed heat shield is designed to reduce intake air temperature without muffling too much intake sound.

## SOUND TESTING

The Mishimoto performance intake provides a louder and deeper intake tone while improving the turbo spool sound. Find our intake sound recordings on the Mishimoto Engineering Blog. <https://www.mishimoto.com/engineering>

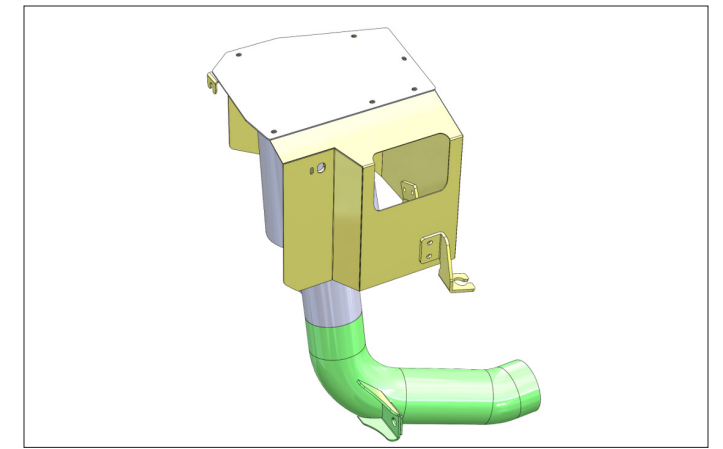


Figure 3: Mishimoto Intake 3D Design

## PERFORMANCE TESTING

The Mishimoto performance intake reduced air restriction by 75.4% over the stock intake system. This improvement in flow resulted in dyno-proven gains of up to 13.3 HP and 16.6 lb-ft of torque on a stock-tuned WRX.

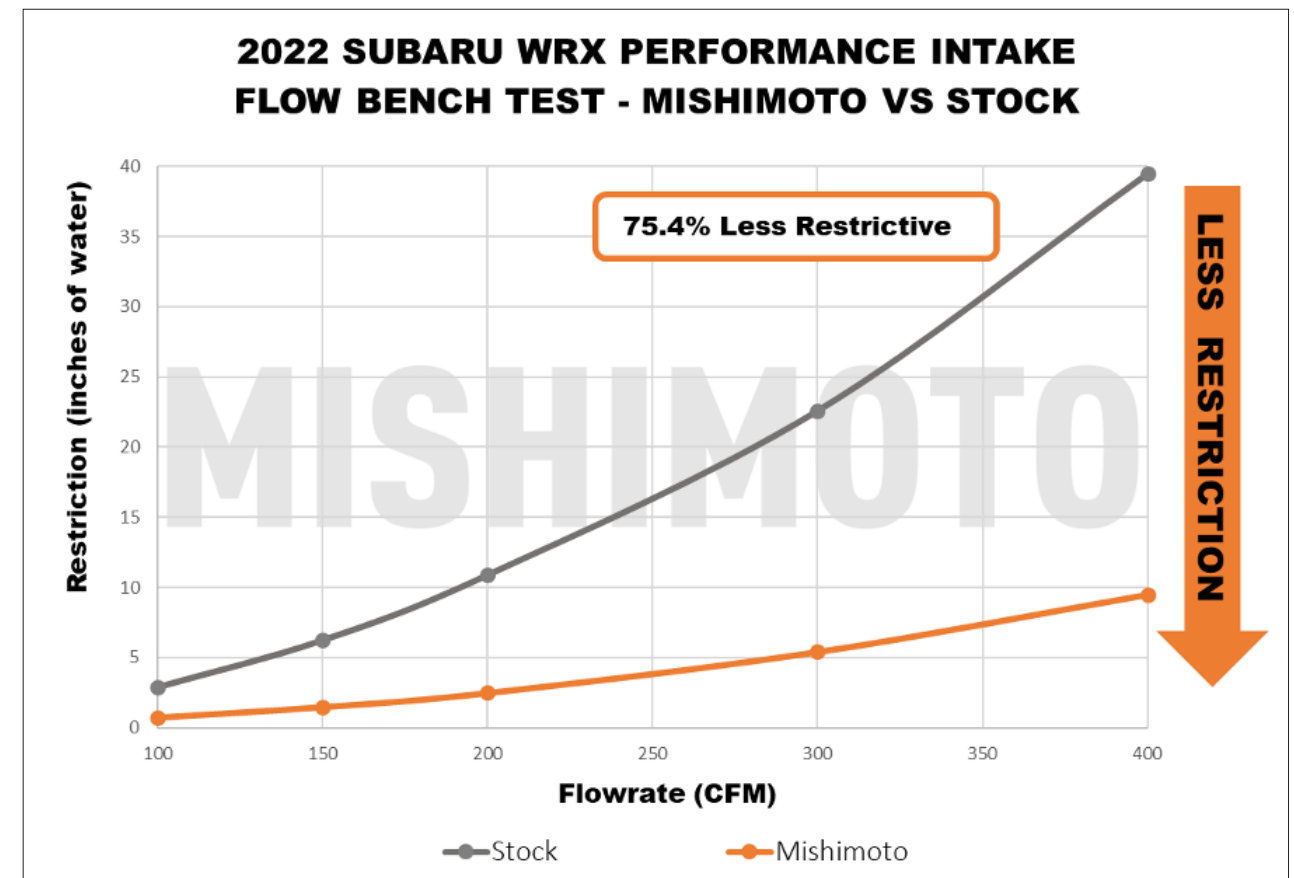


Figure 4: Flow Bench Comparison Chart

## INSTALLATION NOTES

The Mishimoto performance air intake for the 2022+ Subaru WRX 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

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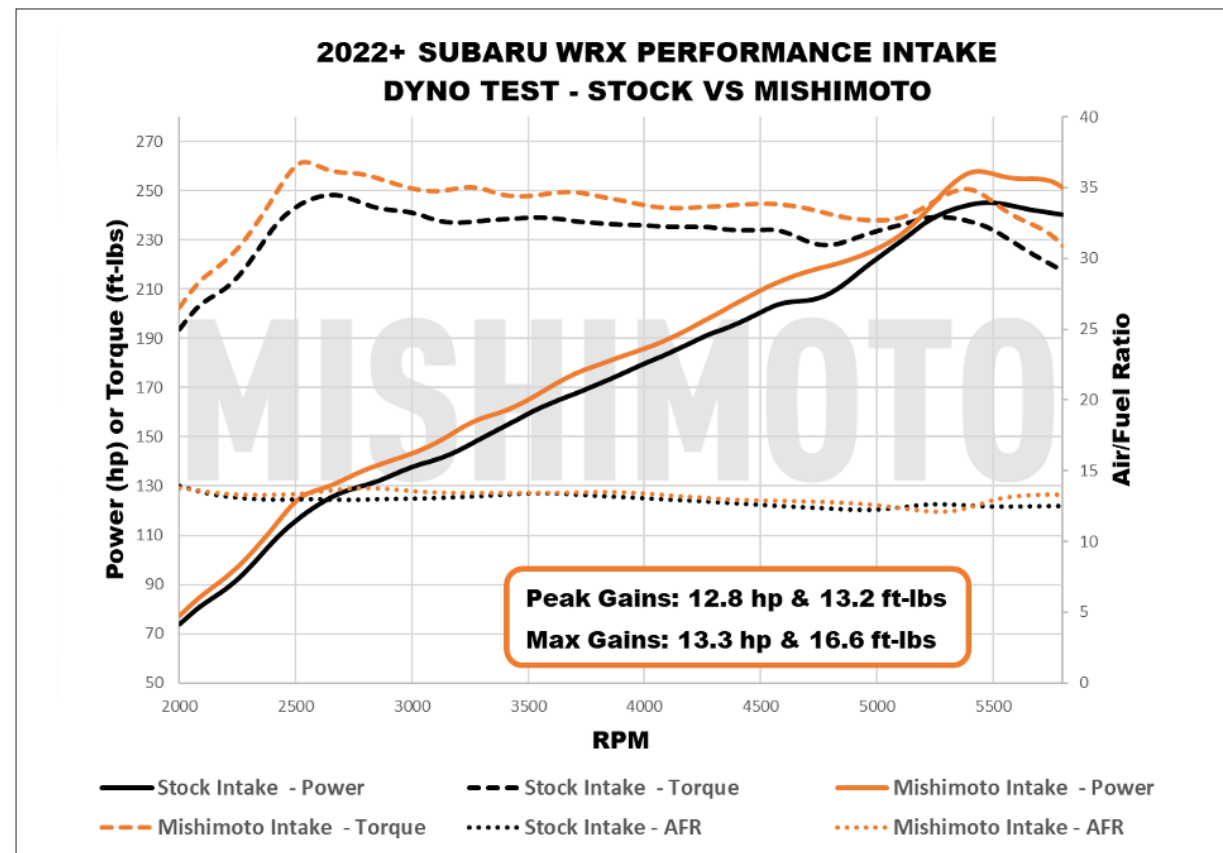


Figure 6: Dyno Results