



ENGINEERING REPORT

2023+ Nissan Z Performance Intake | SKU: MMAI-Z-23X

By: Ye Liu, *Mishimoto Product Engineer*

REPORT AT A GLANCE

- **Goal:** Create a direct-fit, high-quality intake for the 2023+ Nissan Z.
- **Results:** The Mishimoto performance intake reduced air restriction by 42% over the stock intake system in the open-airbox configuration and 25% in the sealed-airbox configuration. This improvement in flow resulted in dyno-proven peak gains of 6.39HP and 4.84lb/ft of torque on a stock-tuned Z.
- **Conclusion:** The Mishimoto performance intake is an ideal bolt-on upgrade for 2023+ Nissan Z owners looking for airflow improvements, increased induction sound, and performance gains.

CONTENTS

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

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
- Configurable design that allows for the customer to choose between sealed or open airbox setup

MATERIAL SELECTION

This intake kit includes two rotomolded XLPE plastic airboxes with steel bracketry, two CNC aluminum MAF housings, and two silicone couplers.

DESIGN AND FITMENT

Our design process started with taking the stock intake apart, thoroughly investigating the system, and searching for possible improvements. The Z features a powerful VR30DDTT 3L V6 engine with twin turbochargers. The 400hp horsepower platform has a tightly packed engine bay and little room left for the traditional top-and-bottom-split airbox design commonly seen by OEMs. Therefore, Nissan created a unique one-piece airbox design with vertically inserted panel filters to maximize flow area while minimizing the air cleaner housing footprint inside the engine bay. With these compact stock airboxes removed, we evaluated the space to create a pair of custom-made, oiled high-flow conical filters that increase effective filtration area by 20%.

Next, we set out to create a unique airbox design that would allow customers to choose between a loud, high-flow intake and a cold-air intake. Each airbox features a quick-release upper half that can be removed to expose half of the filter. A fully sealed airbox provides the best insulation from radiating engine bay heat and lower intake air temps (Figure 3). When the top half is removed, each intake will provide maximum flow and sound with the air filter exposed (Figure 4). Flow bench results can be found in Figure 5 & Figure 6 below.

For any aftermarket intake design on MAF (Mass Air Flow)-based vehicles, it is crucial to keep the MAF calibration as close to stock values as possible for the intake to be safe to run on factory tune. We investigated the possibility of reusing the bolt-on MAF housings on the stock intake but discovered that with the increased airflow, stock housings would cause the MAF readings to deviate more than desired. For optimum performance and engine safety, the Mishimoto intake comes with two CNC-machined custom MAF housings designed

through many rounds of dyno testing. The final dyno results can be found in Figure 7.



Figure 1: Stock intake

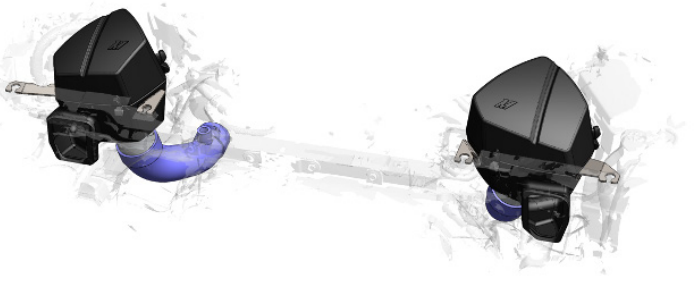


Figure 2: Mishimoto intake 3D design





Figure 3: *Mishimoto Intake in Closed Airbox Configuration (3D printed prototype)*

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>

PERFORMANCE TESTING

The Mishimoto performance intake reduced air restriction by up to 43% over the stock intake system. This improvement in flow resulted in dyno-proven gains of 6.39hp and 4.84lb/ft of torque on a stock-tuned Z.

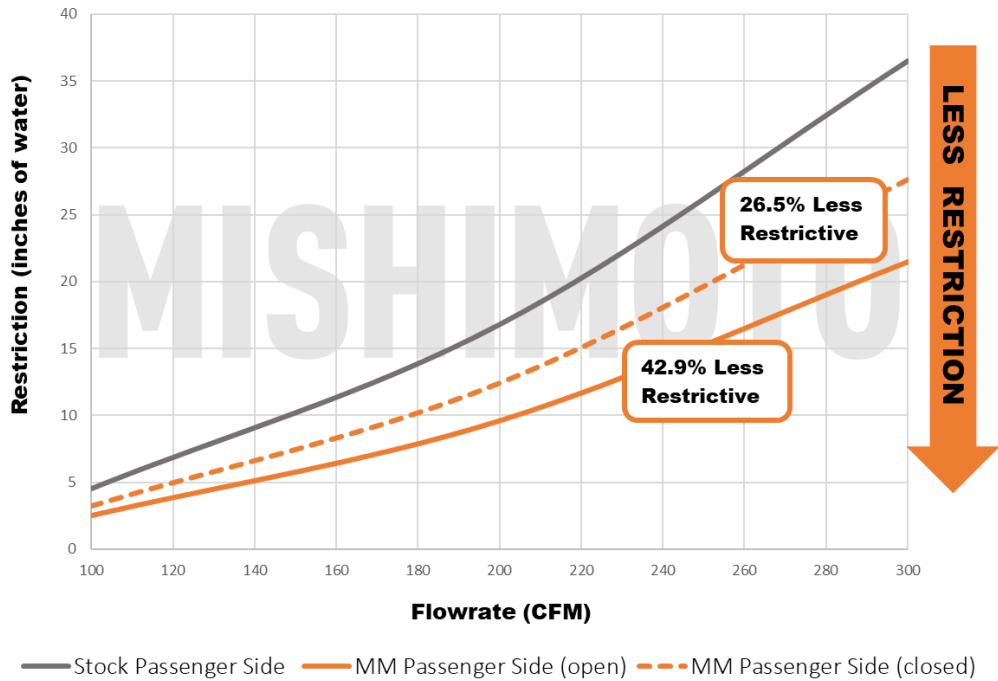
INSTALLATION NOTES

The Mishimoto performance air intake for the 2023+ Nissan Z is a direct-fit upgrade that is safe to run on the stock tune and requires no permanent modification.

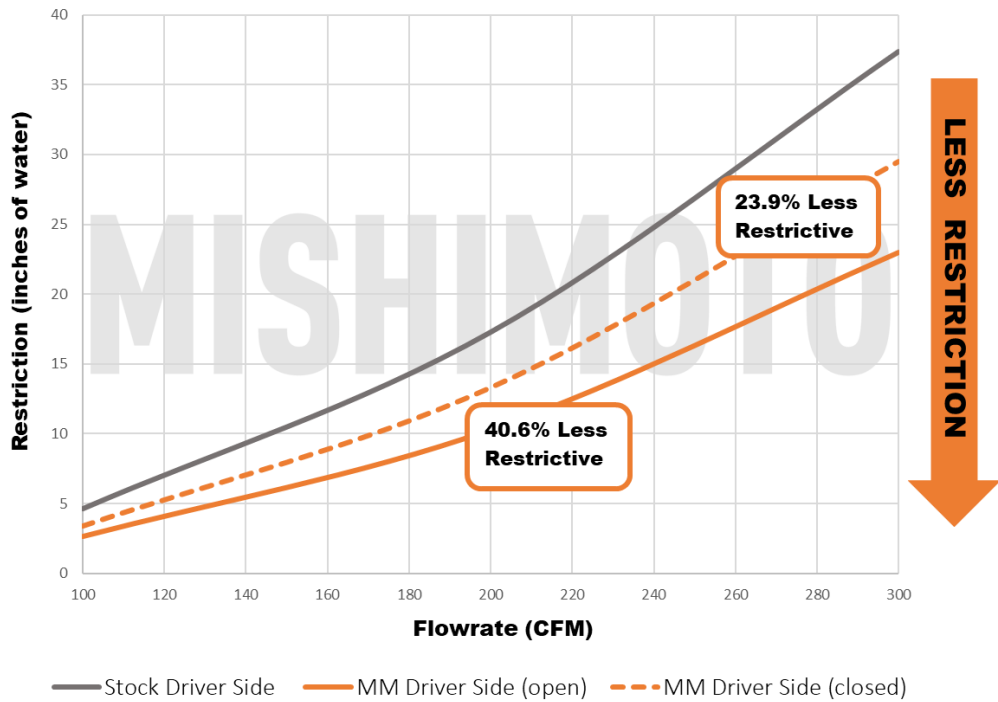
TESTING DONE BY:

Ye Liu, Mishimoto Product Engineer

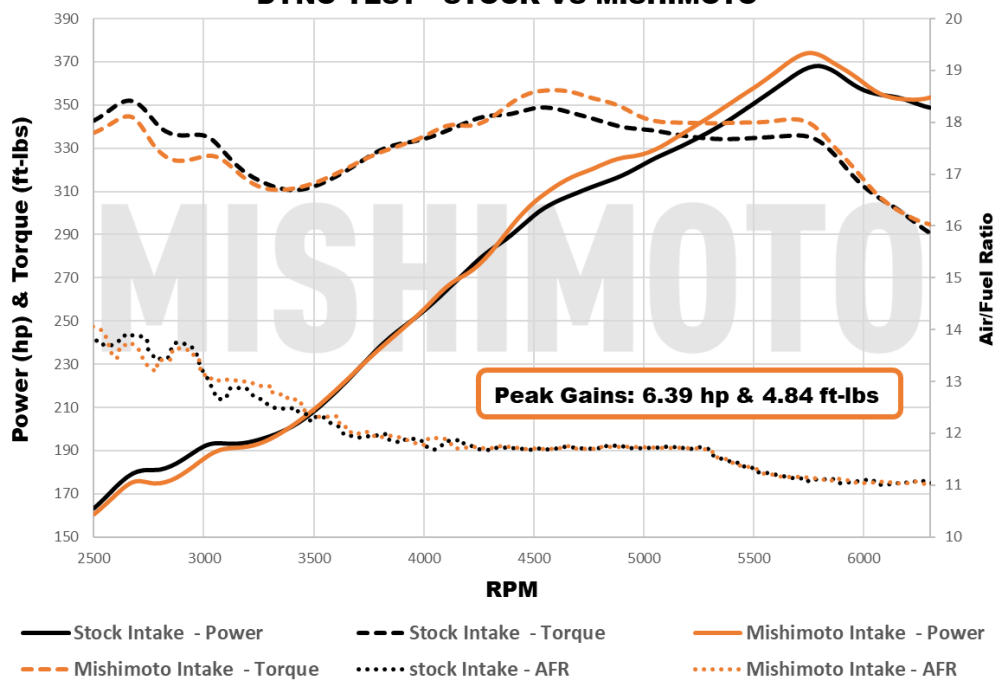
**2023+ NISSAN Z PERFORMANCE INTAKE
FLOW BENCH TEST (PASSENGER SIDE) - STOCK VS MISHIMOTO**



**2023+ NISSAN Z PERFORMANCE INTAKE
FLOW BENCH TEST (DRIVER SIDE) - STOCK VS MISHIMOTO**



2023+ NISSAN Z PERFORMANCE INTAKE DYNO TEST - STOCK VS MISHIMOTO



FOLLOW US

Mishimoto is very active on social media so we can be in constant contact with our customers. Our Social Media Team is available via Facebook, Instagram, Youtube, our Engineering Blog, and forums. We sponsor contests and promotional events, so be sure to follow us.



GOMISHIMOTO



MISHIMOTO.COM/
ENGINEERING



MISHIMOTO



#MISHIMOTO

CONTACT US

Email

For sales and technical
questions please contact
support@mishimoto.com

By Phone

USA: 877.466.4744
International: +1.302.762.4501
Fax: 302.762.4503

Mail

Mishimoto
7 Boulden Circle,
New Castle, DE 19720

Visit

Mishimoto.com
Mishimoto.co.uk
Mishimoto.eu

