



# Spoiler Alert!

## The differences between Spoilers, Splitters, Wings and Diffusers

Aftermarket parts add a custom look to Corvettes, but many times they also serve a functional purpose. Spoilers, Splitters and Diffusers all provide performance benefits, from increased aerodynamics to better downforce on the car. Whether you're looking for pure style or want added kick, it's important to know the function of each part.

### Reduce Drag, Improve Handling

A diffuser, in an automotive context, is a shaped section, typically located in the muffler area of a Corvette. It improves aerodynamic properties by enhancing the transition between the high-velocity airflow underneath the car and the much slower, freestream airflow surrounding the Corvette.

Basically, as air flows into the underbody from the front and sides of the car, the diffuser creates a space for the underbody airflow to decelerate and expand in area (density remains constant at the speeds of travel) to reduce excessive flow separation and drag, by providing a degree of "wake infill" or more accurately, pressure recovery. The diffuser itself accelerates the air flow in front of it, generating downforce and keeping the Corvette snug to the road.

The floor panel hugs the ground and moves a large amount of air rearward without disturbing it.

Diffuser. Depending on the angle, shape and surface area, the performance changes drastically. One of the most important ground effect pieces.



This is the level where the air becomes compressed and forced towards the underside with a reverse wing — causing downforce.

The air forced in from the front is sucked out quickly creating a low pressure area and helping with downforce.





### Give Your Diffuser a Boost

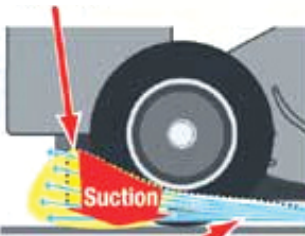
Splitters serve a similar purpose as Diffusers, only at the front of the car. A Splitter is designed with an upward facing surface, allowing high pressure to increase the amount of downforce at the front of your Corvette. By redirecting air away from a air dam, the Splitter causes the air to accelerate, creating a downforce.

The larger the area of the splitter, the more downforce is generated for improved handling. In most closed-wheel race cars, the underside of the splitter smoothly integrates with the undertray, creating one large flat plane that is driven by the rear diffuser. Some race cars actually use an additional diffuser immediately behind the splitter to help create even more downforce, keeping them on the track while cornering at high speeds. The air extracted by this extra diffuser is expelled through vents in the sidepods or above the car around the cockpit.

### Science of Airflow

The diffuser on the underbody of the car guides the incoming air at the rear upwards so it creates the strongest possible vacuum (suction effect). The air flows faster under the wings than over them and also creates a vacuum.

Slow air

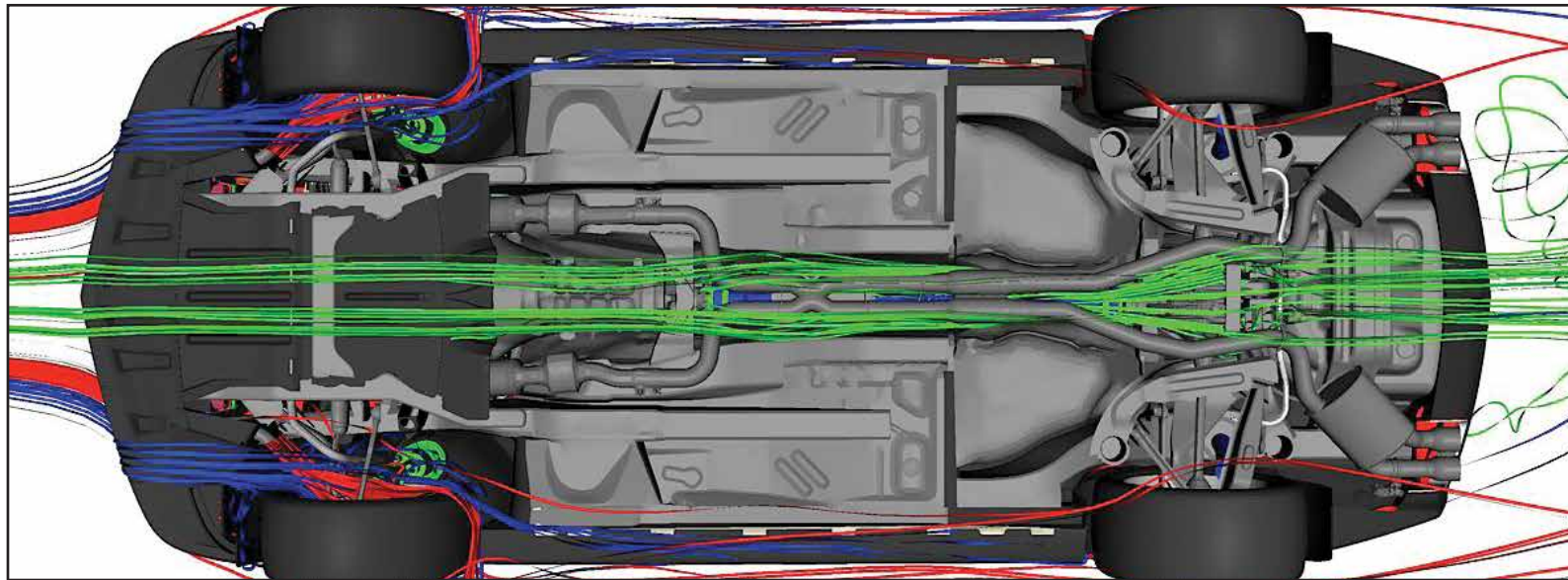


Fast air

Overpressure zone



Vacuum zone



### Spoilers

A Spoiler is designed to “spoil” air flow across the body of your Corvette, usually described as turbulence or drag. Spoilers are available for the front end and the rear end of a car. Also called air dams, Front Spoilers reduce the amount of air flowing underneath the vehicle, which generally reduces aerodynamic lift and drag. Spoilers have become a mainstream automotive accessory, appearing on passenger vehicles in addition to race and high-performance sports cars. While some Spoilers are added primarily for styling purposes and have little-to-no aerodynamic benefit, they all serve as the last line of defense between your Corvette and parking blocks, speed bumps and offset driveways. A Rear Spoiler is a rear mounted





air deflector that mounts flush to the body of your Corvette. Adding a Rear Spoiler creates a gentler slope from the roof to the rear of the Corvette, increasing aerodynamic performance.

*Replacing a Front Spoiler on your Corvette is easy.*

[Watch this video to see how it's done on a C5.](#)

[Watch this video to see how it's done on a C6.](#)

## Wings

Wings differ from Rear Spoilers in that they are mounted to 2 pedestals on the Corvette's body and do not actually touch your car. Air flows over the top and bottom of the Wing, creating a pressure differential that causes some downforce. However, Wings provide the least performance benefits of the options available and are mostly added for looks, except for the cases of Active Wings.

An Active Wing adjusts in conjunction to the change in speed of a vehicle to fully maximize downforce and airflow. Active Wings are prevalent in racing, depending on the type regulations at the race. They derive from the airfoils and flaps on aircraft that direct air around the plane. They use motors to adjust the position and angle of the Wing for optimal performance. One of the best-known vehicles with Active Wings are Porsches. More technologically advanced vehicles, like the McLaren MP4-12C and the Bugatti Veyron, feature a variety of Active Wing that are determined by readings from the car's internal computer. On these automobiles, the Wing can tilt almost vertically under heavy braking to act as an air brake system.

Now that you know the differences, which one is right for your Corvette? Click here to add performance and handling with [Mid America Motorworks' aftermarket spoilers, splitters, diffusers and wings.](#)

