



Road And Wind Noises

(Alternate Methods To Fight Road And Wind Noises)

Document# 999503

For additional information on similar topics, please consult the following technical documents:

999501 How To Eliminate Engine Noise (For Basic Radio Installations)

999502 How To Eliminate Engine Noise (For Amplifier And Additional Audio Equipment Installations)

Does It Seem The Sounds From Outside The Car Are Louder Than Your Stereo?

Unless you drive a luxury vehicle, you have probably experienced the affects of road and wind noises. Well, what are road and wind noises?

Road Noise: road noise is really a wide range of problems, none of which you have any direct control over. Common road noises include the sound from other vehicles, noises from your own vehicles engine, the sound of your own vehicles tires, the sound of a passing motorcycles, and other noises common to moving vehicles. Road noises are audible differently in each vehicle, simply because each auto maker designs and produces vehicles differently. Road noises are now being looked at by most auto makers as a problem that vehicle owners and potential buyers look at. How do road noises enter into a vehicle? Road noises can enter in just about every part of the vehicle, and auto makers as well as car stereo installers can take steps to reduce the entrance of road noise. The design of the vehicle has a lot to do with the entrance of road noise. Auto makers are always trying to reduce costs by reducing the weight of the vehicle. In order to do this, auto makers have begun to design the shell or body of vehicles with thin metal and fiber-glass, convert interior body panels to plastics, and replace many interior objects with thin fabrics and lightweight carpets.

Lightweight metals: the skin of automobiles continue to get thinner: door panels, side panels, trunks, everywhere the metal skins of vehicles are getting thinner. This affects the automobiles ability to block road noises. Doors, floorboards, and even the roof of the vehicle are all primary locations for road noise where thin metal is usually found. One reason luxury vehicles tend to block road noise is that they are usually constructed of heavier body and structural metals.

Plastic panels: newer vehicles seem to have plastic paneling in virtually all parts of the vehicles interior. Plastic does not block sound very well, especially the thin plastics of automobile dashes. It would seem logical that the panels inside the vehicle would help block the entrance of road noises into the vehicle, but what has happened is that auto makers have removed foam padding between interior panels and the metal skin of the vehicle and replaced the entire interior panel with a plastic panel without padding.

Glass windows: windows play another important role to the entrance of road noises. Glass will block some noises but the key to a window blocking noises from the outside is the frame or assembly that holds the window in place. Rubber fittings and rubber molded window assemblies hold the window in place. You may have actually notice that many auto makers use different methods to secure a window. Take a convertible for example; many times there is no window frame on the sides of the window. With this design, rubber molding necessary to keep noises out does not exist. The benefit of a rubber molded window assembly is that when the window on a door rolls up, it must go up into the rubber window assembly, blocking noises from entering over the top of the window. Stationary windows, such as a windshield or rear window must have a solid rubber assembly holding it in place.

Auto makers have begun to take steps to reduce road noises and vibrations in the bodies frame by adding a thin layer of butyl rubber sound deadening material. If you were to pull up the carpet in the floor or trunk of your vehicle, you will probably notice a layer of black instead of the metal of the car frame. This layer of butyl rubber is design to absorb many of the vibrations caused by engine, steering, and transmission components located underneath the vehicle. But you probably will not find this butyl rubber sound deadening material on the sides, or the doors, or the roof of the vehicle.

Wind Noise: Wind noises are similar to road noises in the fact that they seem to affect less expensive vehicles more so than luxury vehicles. There are a couple of different types of wind noises that may affect a vehicle. Wind gusts and improperly sealed windows.

Wind gusts: just about anyone who has driven a vehicle knows the affects of wind gusts on a vehicles ability to steer. Sports cars close to the ground seem less affected than sport utility vehicles or trucks that sit up off the ground higher than sports cars. To a car stereo system, wind gusts tend to drown out the overall sound quality of the stereo system. For many vehicles, wind gusts can practically eliminate the speaker "highs" produced by the speakers tweeter. This is one reason why stereo systems sound so much clearer in luxury vehicles. Stereo systems in luxury vehicles are less likely to be affected by wind gusts because the vehicle has more sound deadening material throughout the vehicle, reducing the sounds caused by wind noise.

Improperly Sealed Windows: There is nothing worse than hearing the wind whistle through the seal around a window in the vehicle. These noises are caused by air gaps between the glass of the window and the rubber seal the glass slides into when it is rolled up. These noises can easily drown out the mids and highs produced by a speaker.

So, How Do You Prevent Or Eliminate Road And Wind Noises?

The first step is sometimes the hardest: find the source of the road or wind noise. Many times, road noise is generated through the entire vehicle. To reduce road noise usually requires an entire vehicle approach. Wind noises are generally localized to a certain spot in a vehicle, usually a window.

Road Noise: One of the best and most proven methods to reduce road noise is to install sound deadening material inside the vehicle. Sound deadening material will do (2) things: Reduce vibrations while absorbing many of the sounds, and thicken the metal the sound deadening material is applied to. There are a couple types of materials to aid in the reduction of sound deadening inside a vehicle.

Butyl Rubber or rubberized sound deadening material: These products are being marketed heavily to the automotive electronics industry. The idea is not new, but a proven product line to aid in the reduction of road noises. These products are thin, approximately 1/8" to 1/4" thick, and are applied directly to the metal skin of the vehicle. Because they are typically rubber based, they tend to absorb vibrations in the metal skin of the vehicle. They also thicken the metal skin which gives an additional layer outside noises must pass through to enter the vehicle.

Carpet Padding: Automotive carpet is different than home or residential carpet in the fact that automotive carpets typically do not have padding below the carpet. If they do, the padding is a thin layer attached to the underside of the carpet. Home or residential carpets typically have a separate foam padding that is installed below the carpet. These foams, or an automotive grade foam padding, can be installed underneath the carpet in the vehicle to give a second layer to aid in the absorption of sounds entering into the vehicle.

Wind Noise: For some vehicles, the rubber seal the window slides into may be worn or stretched out causing air gaps between the glass of the window and the seal itself. For these situations, a vehicle owner is advised to visit a local autoparts store or a local auto dealerships to see if there are replacement seals for their particular window assembly, or a generic seal kit that can be used.

Other Areas That Traditionally Do NOT Have Any Sound Deadening Material Or Padding Installed By The Automaker:

Roof Liners: There are some other areas that need to be looked at to help in the reduction of road and wind noises. The roof of the vehicle typically has NO padding or sound deadening material installed above the roof liner material. Many hi-end car audio installs will include this into their installs. This requires pulling off the roof liner fabric or panel and applying either a sound deadening material directly to the metal skin or installing padding.

Window Pillars: Window pillars are the metal bar between the front windshield and the front door windows. Although these are thick metal frame bars, automakers never install sound deadening material to the pillars. This is a great place for the rubberized sound deadening material to be applied.

Doors: Doors are a constant source for vibrations and road noises to enter. Vehicle doors are complicated because there are (2) layers to a door: the outer skin which is typically thin, and the inner metal layer where the door panel is attached to. There is approximately 4 to 6 inches of space between each layer to allow the window to roll down and to contain the motors and mechanical assemblies for the window. Many professional car audio installers will target these areas when installing new door speakers. They will go ahead and apply the rubberized sound deadening material to both layers of the door.