Subject: Ground loop isolator
Posted by moss24 on Tue, 03 Oct 2017 13:20:10 GMT
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How necessary is this when talking about a car audio system considering that a car's metal chassis will definitely have some resistance? How much would this cost on average?

Subject: Re: Ground loop isolator
Posted by Wayne Parham on Tue, 03 Oct 2017 13:48:28 GMT
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Ground loops in cars are just like ground loops in homes. They're caused by resistance in the ground path.

An isolator is best used when it isn't possible or practical to use a single point ground. When two devices are physically distant, it becomes impossible to have the grounds at each end be the same. Each has its own ground. And if you try to tie the two together with a conductor, this makes things worse. This only creates two electrical paths - one through the earth and one through the second conductor. This leads to uneven current flow in the two paths, which is the very definition of a ground loop. In this case, the best approach is to use an isolator. Don't even try to connect the grounds together. Couple the signal a different way, like through an electromagnetic (transformer) or an opto-electronic isolator.

But in a car, the issue is much easier to solve by simply using a single point ground. The problem that usually presents itself in a car is power ground(s) connected to the chassis and sometimes additional ground connections made through an audio signal line. The audio signal could be a common ground speaker output or a preamp line level connection. If the chassis is connected to the battery at the engine and/or elsewhere at the front of the car, then there will be more resistance in the ground path when connection is made to the chassis at the rear of the car. This can cause a ground loop. The solution is to use good conductors that are large enough to offer low resistance and to connect all audio system grounds to the chassis at a single location.

Subject: Re: Ground loop isolator
Posted by drake on Tue, 03 Oct 2017 14:59:59 GMT
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At times I read such vivid explanations and wish I had pursued Physics further. All I can recall is that a good conductor is a substance with 3 or less electrons in its outer orbit. An insulator, on the other hand, normally has difficulty exchanging electrons because it contains 5 to 7 electrons in the outer orbit.