How to Degauss Car Tires

Car tires generate electromagnetic fields (EMF) when the car is moving. This article describes how to select tires that generate less EMF and how to degauss tires so they generate much less..

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Why do tires generate EMF?

Almost all car tires have steel belts built into them to give them strength and puncture resistance. These steel belts become magnetized during the manufacture of the tire. When the tire spins around it is as if a set of little magnets are spun around in a circle, as in an electrical generator.

It is easy to demonstrate this effect using a gaussmeter and a small magnet, such as a refrigerator magnet: hold the magnet in the hand and move it around in a small circle close to the meter. The faster the magnet is moved, the higher the reading.

When a car moves down the road, the spinning tires create a magnetic field inside the car that can expose a person to a pulsing magnetic field that often can reach 20 to 30 milligauss (2 to 3 uT). The highest levels are in the footwell, close to the tire (Milham, 1999; Halgamuge, 2010).

The radiation level increases with the speed of the vehicle. The frequency changes somewhat, but is typically around 12 hertz (Milham, 1999; Halgamuge, 2010).

If you want to measure it yourself, be aware that most gaussmeters cannot measure these low frequencies accurately. Also, if the wheel has a magnetic sensor it will radiate when the wheel spins (this may be the reason for some of the high numbers reported by Halgamuge).

The magnetism in the tire does not decay with time. It does not help to use old tires (Halgamuge, 2010).

In most cars it is only the tire nearest the sensitive person that can be a problem, but since tires are sometimes rotated it is best to degauss all the tires, including the spare.

The tires may not be the main problem

Some people with electrical hypersensitivities (EHS) get symptoms from driving their car (Granlund-Lind, 2004; Evans, 2010). That can have other causes than the magnetized tires.

The alternator can often generate a stronger field than the tires, and the pulsing 12 volt DC current it sends out on the wires will make them radiate as well. Anti-lock brakes usually have magnetic sensors on each wheel and put out magnetic pulses when turning. This can be measured with a gaussmeter, especially in the front foot well and dashboard. Gasoline cars also have a radiating ignition coil.

Modern cars have many other sources of radiation, most of which cannot be picked up by a gaussmeter. These include the dozens of microprocessors throughout the car, wireless communication with any smart key, dashboard controls, wireless tire-pressure monitors, etc.

You can test to see if the tires are likely to be a major problem. Find a place that does not produce symptoms if just standing there without the car. Then park the

car there and sit in it with the engine running, but the car not moving. The tires do not create any EMF when the car sits still. If the symptoms are less than when driving the car, the tires are likely to be a problem (other possibilities include anti-lock brakes, wireless tire pressure sensors, speedometer, motion sickness and vibration sensitivity).

If you are testing an electric or hybrid car, the above method will not work. The electrical system in those cars radiate much more when the car is moving than when it sits still.

For More information on troubleshooting EMF in cars, see the link at the end of this article.

How to find less magnetized tires

The magnetization depends on the method used to manufacture the tire. All tires manufactured the same way will be magnetized the same. That means it is just necessary to select a specific tire model, it is not necessary to check each individual tire when buying them.

Some manufacturers make tire models that are highly magnetized and also models that are much less so. One example is Michelin. There doesn't seem to be a particular manufacturer that is consistently good.

For some years, people in the United States have had good results with the Weatherizer Telstar tires. Others have used the Michelin Symmetry or the Barum Brillantis 2 tires. Any tire store should be able to special order them.

A way to find a less-magnetic tire is to go to a tire store and use a magnetometer on the various brands and models. This can be done very quickly and does not need to involve any store staff.

A magnetometer measures strength of magnets, using a scale in gauss or tesla. Magnetometers are sometimes also called a "DC gaussmeter." There are electronic and mechanical versions available; both work well, though people with EHS may prefer the mechanical versions.

Simply place the magnetometer on top of the tire tread. Then move it slowly along the circumference of the tire and note how much the reading fluctuates. The more it fluctuates the worse the tire. This fluctuation is more important than the actual reading in gauss or tesla.

Using a mechanical magnetometer on a car tire.

If you use a mechanical magnetometer, be aware that tilting the meter can affect the dial. This can give a false reading when moving down the tread so the magnetometer becomes vertical.

A small compass can also be used, though it is cruder.

There are tires made without any steel belts but they are not as durable and they are difficult to find. They are definitely not recommended for cars that travel on gravel roads or need to pass over sharp curbs.

The degausser

Magnetization is removed using a degausser, which is a coil that emits a very strong alternating magnetic field. It sends out a field that is typically hundreds of milligauss (ten thousands of nanoteslas). People with EHS should be at least 15 ft. (5 m) away from it when it is turned on. It is harmless when the electricity is off.

The degausser usually operates at the same frequency as the electrical service, i.e. 60 hertz in North America and 50 hertz in the rest of the world.

If the degausser is in direct contact with the tire tread it will magnetize the steel belt below it uniformly. It will also change the direction of this magnetization 120 times a second (60 hertz) or a hundred times a second (50 hertz). If the degausser is then slowly removed from the tread, the strength of this magnetization will become less as it continues to change direction. This is because the field from the coil becomes weaker with distance.

It is imperative that the coil is moved away slowly to make this work. Any fast movement or sudden shutoff of the electricity can leave a strong magnetic "hot spot" that can be difficult to remove again. It is the slow removal of the coil that gradually weakens the magnetism in the steel belt.

How to use the degausser

With the above explanation, the following instructions should make sense.

The tire must be able to spin freely and easily. This can be done if the car is lifted off the ground or if the tire is removed from the car and mounted on a spindle of sorts. It has been done on the device tire shops use to balance tires, but without using the motor in it as it goes too fast.

It is best done by two people: one to turn the wheel and the other to operate the degausser. It can be done by a single person, but it is difficult to do smoothly.

The procedure is as follows:

- Hold the degausser at least 3 ft. (100 cm) from the tire
- Start spinning the wheel very slowly and continue to spin it at a constant slow speed of less than ten revolutions a minute
- Turn on the degausser
- Move the degausser slowly towards the tread of the tire until it lightly touches the surface and is held steady while the tire is still spun.
- After some revolutions of the tire then very, very slowly move the degausser from one side of the tread to the other.
- When all the tread surface has been under the degausser, then slowly move it away again — no jerky motions.

- When the degausser is at least 3 ft. (100 cm) away from the tire, then turn off the power and stop spinning the tire.

- Check with the magnetometer to see how much magnetism is left.

- Redo as needed, until there is very little magnetization left, or it is at least very smooth (unfluctuating).

The operative word here is always use smooth movements, no jerky motions, and never stop while the degausser is on. The degausser may get very warm after a while. That is normal, just turn it off and let it cool off.

People with EHS should not operate a degausser. They should not be closer than 15 ft. (5 m) when the degausser is on — it is harmless with the power removed.

If the degaussing was not done smoothly, new spots of strong magnetization ("hot spots") could be created. Hot spots are difficult to remove. Some tires are born with strong hot spots. It may be impossible to degauss some tires, the only option is then to replace them (see earlier).

Degaussing tire mounted on the car. One hand spins the tire while the other hand operates the degausser. It can be done by a single person, but it is harder to do the movements smoothly and with no stops.

Degaussing on a tire balancer in a tire shop.
The tire is spun manually, not by the machine.

If degaussing does not help

If degaussing the tires does not help, consider these possibilities:

- The tire was not degaussed enough. This happens a lot. Repeat procedure. Check with a magnetometer. Some tires cannot be degaussed.
- The problem can be anti-lock brakes or wireless tire sensors instead.
- The problem can be many other sources in the car. How tolerable is the car sitting still with the engine on?

Getting a degausser

Degaussers were used to erase video tapes and audio tapes by people who wanted to reuse them. Computer data centers used degausssers to erase backup tapes in some cases. These kinds of degaussers can sometimes be found online; look for "tape erasers."

A vintage tape eraser

You can also build your own degausser. Detailed instructions are available via the link below.

Degaussing is not new

The navies of the world have used degaussers since at least World War II. They degauss the hulls of their ships to foil magnetic mines that blow up when they detect a magnetic disturbance.

More information

This website has an article about how to build your own degausser. It can be found through the menu: www.eiwellspring.org/vehicle.html, which also contains other articles about low EMF vehicles.

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