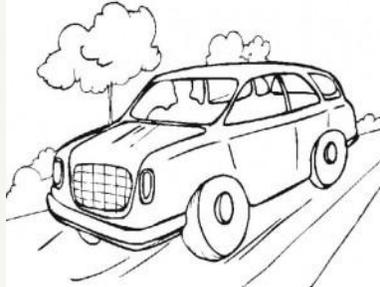


1/8 - Electrical equipment: power harmonics, power factor



Re active energy and **power harmonics** explained with a car

How to understand harmonics & re active energy

Are you a driver? I am sure yes, therefore you will understand power harmonics right away

Imagine a straight road, flat, a perfectly smooth surface, a constant speed. Your car works well, consumes as little as possible, and can run indefinitely.

It's like an electrical grid with a constant power without harmonics.

But now, imagine that the road coating deteriorates. There are irregularities, pavers, slabs of concrete. We can keep the same pace, but less comfortable. Gasoline consumption is virtually unchanged, but the car suspension is deteriorating and high vibrations will affect the mechanical parts.

It's like a grid, its **electrical equipment**, with power harmonics ...

Worse and worse: the road surface is becoming like "corrugated iron". The vibrations are unbearable. If the car does not slow down, everything will break.

It's like a power grid and all electrical equipment in case of harmonic resonance...

Do you understand ?

then I let you imagine what to tell about how to illustrate "The reactive power" ...

I am teasing. Here is the second story:

Imagine a straight road, flat, smooth coating. You drive at constant speed. Your car works well, consumes as little as possible and will run much longer.

Not need a big engine: it runs quiet.

It's like an electrical grid with a constant power.

But now the road is not quite straight. It also turns. To keep the same average speed, the car must accelerate, then slow down, ... Gasoline consumption increased slightly, but to keep pace, it would need a more powerful engine, the tires do work.

It's like a grid and all electrical equipment with reactive power. ...

Jacques Schonek

Coming soon:

- part 2: What is "**Power Factor**"?
- part 3: What are "Harmonics"?
- part 4: How Power Factor and Harmonics relate to Energy Efficiency?
- Part 5: What are the benefits of PFC and Harmonic mitigation
- Part 6: How to improve Power Factor?
- Part 7: How to mitigate Harmonics?
- Part 8: To know more about Harmonics ...

Low Power Factor and Harmonics are growing concerns in the management of electrical systems today. Designers are requested to pay more and more attention to energy savings and improved electricity availability. In this context, the topics of Power Factor and Harmonics are often discussed but there is still a need for more explanation, in order to dissipate confusion and misinterpretation. These topics relate to distinct physical phenomena, but are often correlated. The solutions implemented in electrical installations have to take account of both issues at the same time.

The objective of these articles is to clarify the issue and demonstrate how the business performance of professional customers can be improved by considering Power Factor and Power Harmonics. Significant savings are achievable along with improvement of the electrical energy quality.

Source: <http://engineering.electrical-equipment.org/power-quality/1-8-electrical-equipment-harmonics-power-factor.html>