



## AEROSPACE, AVIATION, TRANSPORTS Magnetic differential for vehicles

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### TRL scale



### What's needed for?

This invention describes a magnetic differential system, made of two interconnected magnetic gears that can be used on most road and railway vehicles. It allows smart electronic control and, contrary to standard mechanic differentials, it does not require lubrication or maintenance. For this reason, its ideal use will be in vehicles that operate in hostile environments. Differentials that are typically used in transmissions function mechanically. They commonly face problems linked to wear and lack of lubrication, especially in extreme environments where it is difficult to operate maintenance regularly. This magnetic differential transmit torque from one input shaft to two output shafts rotating at different speeds. It can connect to any source, such as an electric or heat engine. The magnetic nature of this differential has the following advantages: no lubrication required; reduced vibration since there is no contact with the shaft; can function at temperatures limited only by the magnet's temperature range; elevated conversion efficiency. It can also be integrated with existing active control vehicle safety system.

### Advantages

- Low friction and no vibration
- No lubrication required
- No maintenance required
- Greater temperature range
- Does not require power
- Compatible with Electronic Stability Control (ESC, ESP), Traction control systems (TCS, ASR), Anti-lock braking systems (ABS)

### Applications

- Most road vehicles that require a differential
- Vehicles that operate in hostile environments (mines, space, desert, wind turbines)
- Maintenance alternative to current differential gears in rail vehicles