



Engine and Differential placement

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What this means

Within the automotive engineering industry there is no set way of designing cars, engines, differentials and their positioning are no exception. Manufacturers over the years have experimented with many different configurations, with the most common on today's roads being a front mounted transverse engine along with front wheel drive. This of course does not mean that configuration is the best or that others are not practical as many other cars have very different layouts and are equally as successful as their more common counterpart.

Transverse and Longitudinal engines

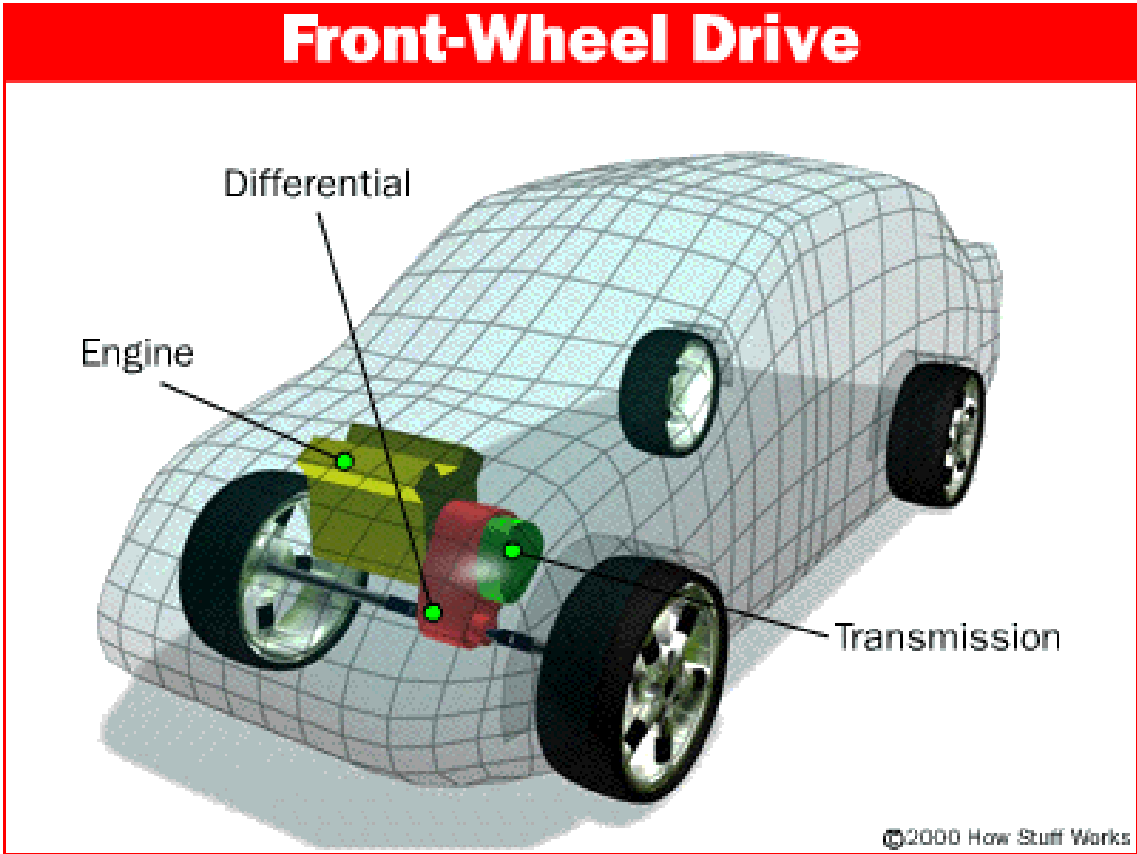
Engines traditionally have two ways of being installed, and that is either Longitudinally or Transverse. Both offer positives and drawbacks.

Transverse offers:

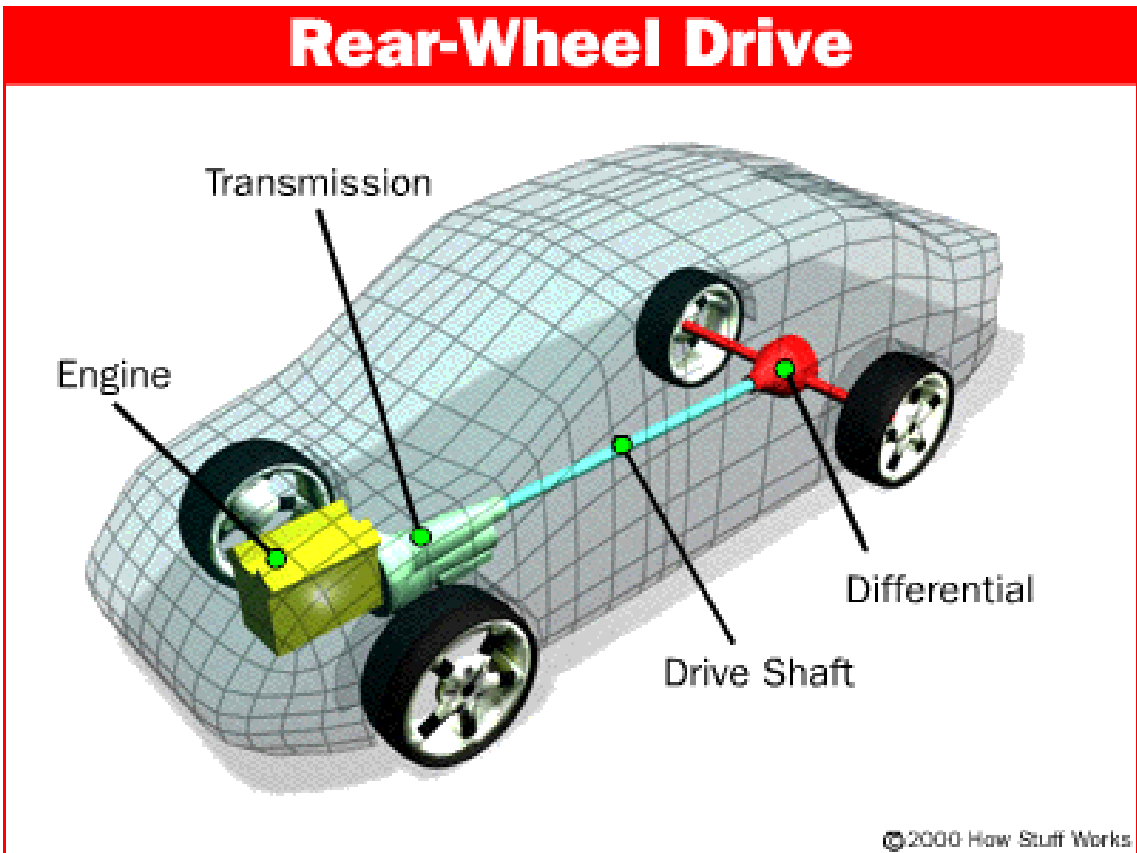
- Less space taken up
- Enhanced safety
- Ease of manufacturing for FWD cars
- Weight close to centre of gravity
- Low manufacturing costs
- Difficulty cooling
- Limited access for maintenance
- Torque steer

Longitudinal offers:

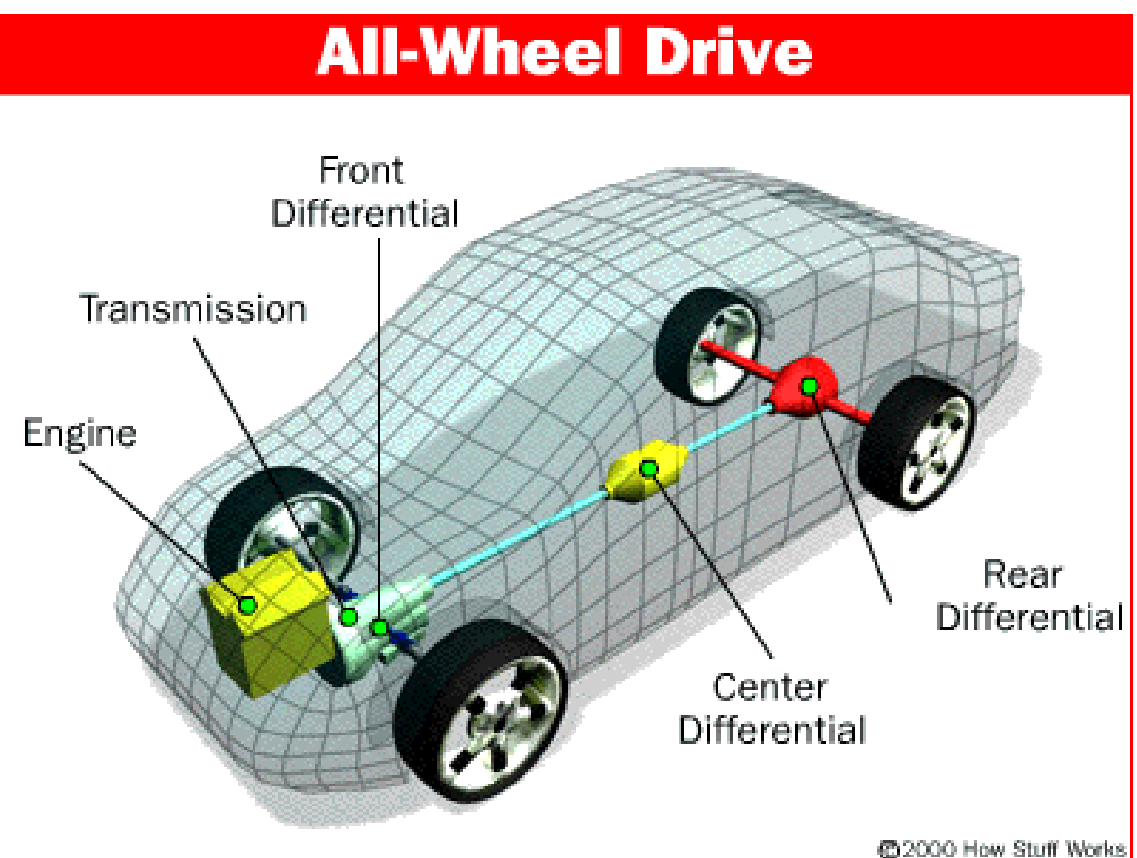
- Freedom of positioning in the car
- The possibility of larger engines
- Heavier than transverse
- More expensive



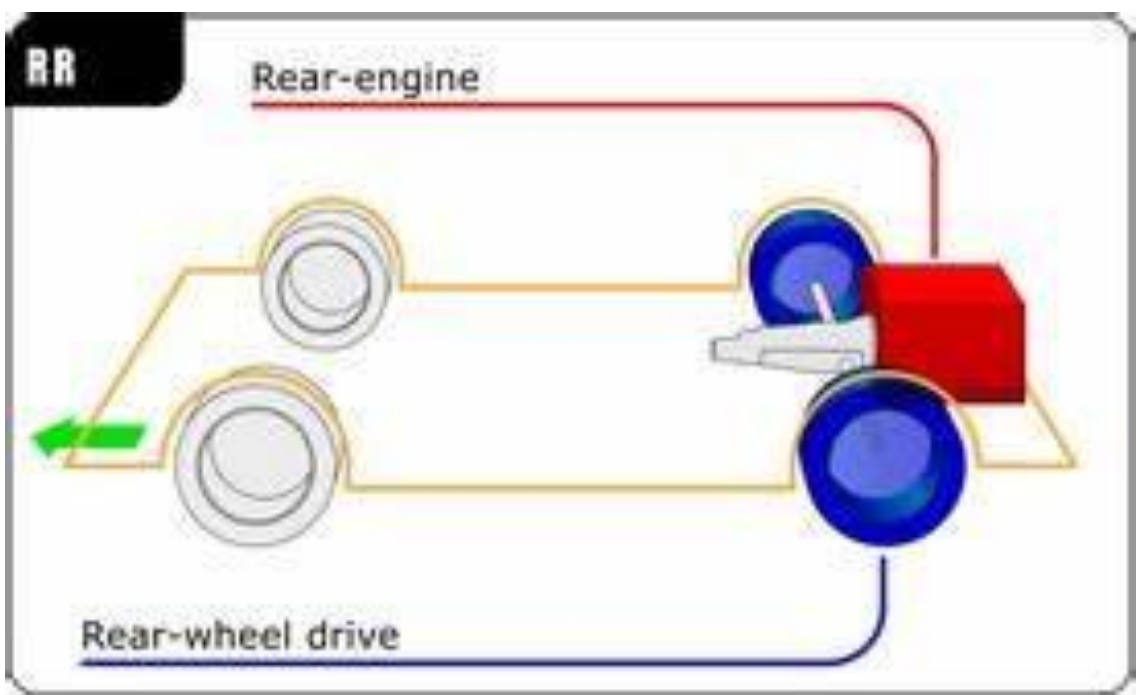
An example of front wheel drive and a Transverse engine layout. [source 1]



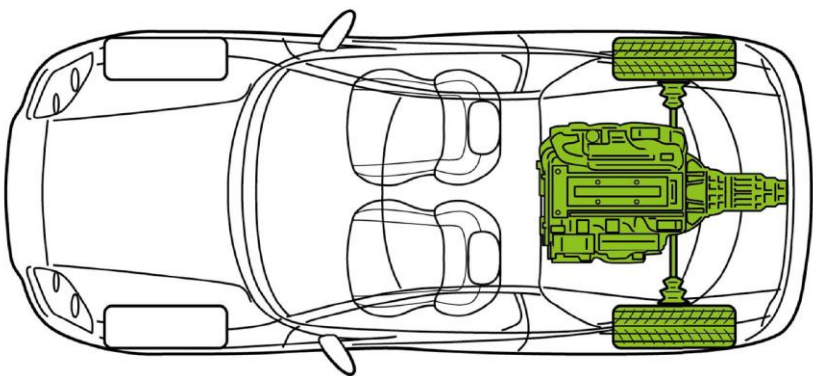
An example of rear wheel drive and a longitudinal engine layout. [source 1]



An example of all wheel drive and a longitudinal engine layout. [source 1]



An example of rear wheel drive and a rear mounted engine.. [source 6]



An example of rear wheel drive and a mid mounted engine.. [source 7]

Engine placement within the car

Engine placement is not just limited to its rotation, it can be placed anywhere in the car where it can be connected to the wheels. This variation is usually referred to as either front engine, mid engine or rear engine. Each offers their own benefits but with two main considerations. These considerations would be weight distribution and ease of manufacturing.

Differential placement within the car

The placement of the differential usually dictates which wheels are powered. If it is in the front then it is usually FWD, same with the back and if there is two or more then it is usually AWD or 4WD. Like engine placement each configuration offers its own benefits, usually having to do with weight distribution and ease of manufacturing.

History of placement and its future

Through automotive history the vast majority of cars have been made with FWD and a front engine design. Sport cars on the other hand have had a preference for being RWD and sometimes mid engine. But as technology evolves more and more cars are being produced with AWD. This is due to improved handling, reliability and also the increase in electric cars where each wheel can have a motor.

References

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