

Off Highway

An **off-road vehicle** (Off Highway) is considered to be any type of vehicle which is capable of driving on and off paved or gravel surface. It is generally characterized by having large tires with deep, open treads and a flexible suspension, or even caterpillar tracks. Other vehicles that do not travel public streets or highways are generally termed off-highway vehicles, which would include tractors, forklifts, cranes, backhoes, bulldozers and Golf carts.

Off-road vehicles have an enthusiastic following because of their many uses and versatility. Several types of motorsports involve racing off-road vehicles. The three largest "4 wheel vehicle" off-road types of competitions are Rally, Desert Racing, and Rock crawling. The three largest types of All Terrain Vehicle (ATV) / Motorcycle competitions are Motocross, Enduro, and also Desert Racing like Dakar Rally and Baja. The most common use of these vehicles is for sightseeing in areas distant from pavement. The use of higher clearance and higher traction vehicles enables access on trails and forest roads that have rough and low traction surfaces.

To be able to drive off the pavement, off-road vehicles need several characteristics: They need to have a low ground pressure, so not to sink in soft ground, they need ground clearance to not get hung up on obstacles and they need to keep their wheels or tracks on the ground so as to not lose traction. Wheeled vehicles accomplish this by having a suitable balance of large or additional tires and tall and flexible suspension.

Tracked vehicles accomplish this by having wide tracks and a flexible suspension on the road wheels. The choice of wheels versus tracks are one of cost and suitability. A tracked drivetrain is more expensive and costly in terms of maintenance. Wheeled drivetrains are cheaper and give a higher top speed. For pure off-road capabilities the tracked drivetrain has the edge.

Most off-road vehicles are fitted with especially low gearing. This allows the operator to make the most of the engine's available power, while moving through challenging terrain slowly. A combustion engine coupled to a normal gearbox often has a too high output speed to be usable. The vehicle often has one of two things; either a very low ("granny") first gear (like the all wheel drive Volkswagen Transporter versions) or an additional gearbox in-line with the first, called a reduction drive. Some vehicles, like the Bv206 in the picture on the right, also has a torque converter to further reduce the gearing .