Difference between armature and commutator

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Here we are going to discuss the main difference between armature and commutator which includes its definitions and functionalities. What is an Armature? In electrical machines like motors and generators, the armature is an essential component that holds AC or alternating current. In a machine, it is a stationary part or rotating part.

In electrical engineering, the armature is the winding (or set of windings) of an electric machine which carries alternating current. [1] The armature windings conduct AC even on DC machines, due to the commutator action (which periodically reverses current direction) or due to electronic commutation, as in brushless DC motors.

An armature is a combination of the winding, commutator, brushes, and ball bearings. It is a core on which all these elements hold to fulfill its own action. It is liable for the generation of flux when the current through the winding associates with the field flux.

A commutator is a rotary electrical switch in certain types of electric motors and electrical generators that periodically reverses the current direction between the rotor and the external circuit. It consists of a cylinder composed of multiple metal contact segments on the rotating armature of the machine.

What is an Armature? An armature is the component of an electric machine (i.e., a motor or generator) that carries alternating current (AC). The armature conducts AC even on DC (Direct Current) machines via the commutator (which periodically reverses current direction) or due to electronic commutation (e.g., in a brushless...

In electrical engineering, the armature is the winding (or set of windings) of an electric machine which carries alternating current.[1] The armature windings conduct AC even on DC machines, due to the commutator action (which periodically reverses current direction) or due to electronic commutation, as in brushless DC motors. The armature can be on either the rotor (rotating part) or the stator (stationary part), depending on the type of electric machine.

The armature windings interact with the magnetic field (magnetic flux) in the air-gap; the magnetic field is generated either by permanent magnets, or electromagnets formed by a conducting coil.

The armature must carry current, so it is always a conductor or a conductive coil, oriented normal to both the field and to the direction of motion, torque (rotating machine), or force (linear machine). The armature"s role is twofold. The first is to carry current across the field, thus creating shaft torque in a rotating machine or force in a linear machine. The second role is to generate an electromotive force (EMF).

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In the armature, an electromotive force is created by the relative motion of the armature and the field. When the machine or motor is used as a motor, this EMF opposes the armature current, and the armature converts electrical power to mechanical power in the form of torque, and transfers it via the shaft. When the machine is used as a generator, the armature EMF drives the armature current, and the shaft"s movement is converted to electrical power. In an induction generator, generated power is drawn from the stator.

The word armature was first used in its electrical sense, i.e. keeper of a magnet, in mid 19th century.[2]

The parts of an alternator or related equipment can be expressed in either mechanical terms or electrical terms. Although distinctly separate these two sets of terminology are frequently used interchangeably or in combinations that include one mechanical term and one electrical term. This may cause confusion when working with compound machines like brushless alternators, or in conversation among people who are accustomed to work with differently configured machinery.

In most generators, the field magnet is rotating, and is part of the rotor, while the armature is stationary, and is part of the stator.[3] Both motors and generators can be built either with a stationary armature and a rotating field or a rotating armature and a stationary field. The pole piece of a permanent magnet or electromagnet and the moving, iron part of a solenoid, especially if the latter acts as a switch or relay, may also be referred to as armatures.