Current flows from it through diode (D_1), then through the load resistor, and through diode (D_2) on its way back to the top of the secondary coil. When the AC reverses its cycle, the polarity of the secondary coil changes. Current flows from the top of the coil through diode (D_3), then through the load resistor, and through diode (D_4) on its way back to the bottom of the secondary coil. The output waveform reflects the higher voltage achieved by rectifying the full AC cycle through the entire length of the secondary coil.

Use and rectification of three-phase AC is also possible on aircraft with a specific benefit. The output DC is very smooth and does not drop to zero. A six-diode circuit is built to rectify the typical three-phase AC produced by an aircraft alternator. *[Figure 11-46]*

Each stator coil corresponds to a phase of AC and becomes negative for 120° of rotation of the rotor. When stator 1 or the first phase is negative, current flows from it through diode (D_1), then through the load resistor and through diode (D_2) on its way back to the third phase coil. Next, the second phase coil becomes negative and current flows through diode (D_3). It continues to flow through the load resistor and diode (D_4) on its way back to the first phase coil. Finally, the third stage coil becomes negative causing current to flow through diode (D_5), then the load resistor and diode (D_6) on its way back to the second phase coil. The output waveform of this three-phase rectifier depicts the DC produced. It is a relatively steady, non-pulsing flow equivalent to just the tops of the individual curves. The phase overlap prevents voltage from falling to zero producing smooth DC from AC.

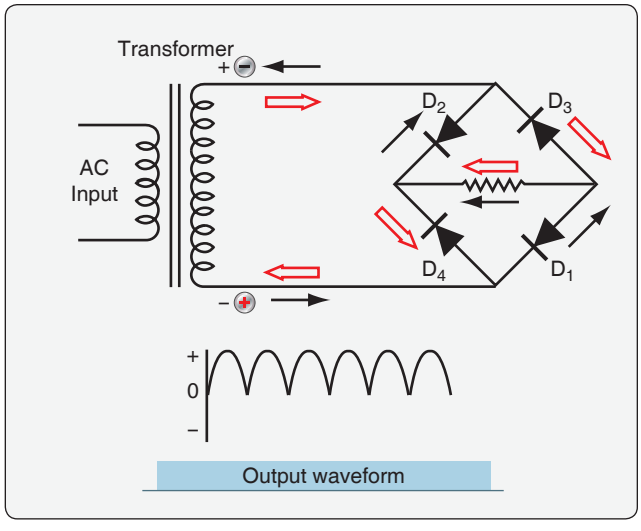

Figure 11-45. *The bridge-type four-diode full wave rectifier circuit is most commonly used to rectify single-phase AC into DC.*

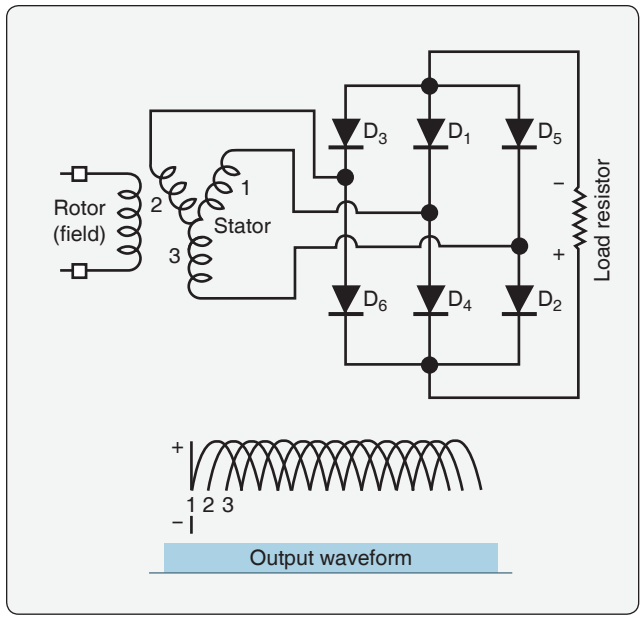

Figure 11-46. *A six-diode, three-phase AC rectifier.*

Amplifiers

An amplifier is a circuit that changes the amplitude of an electric signal. This is done through the use of transistors. As mentioned, a transistor that is forward biased at the base-emitter junction and reversed biased at the collector-base junction is turned on. It can conduct current from the collector to the emitter. Because a small signal at the base can cause a large current to flow from collector to emitter, a transistor in itself can be said to be an amplifier. However, a transistor properly wired into a circuit with resistors, power sources, and other electronic components, such as capacitors, can precisely control more than signal amplitude. Phase and impedance can also be manipulated.

Since the typical bipolar junction transistor requires a based circuit and a collector-emitter circuit, there should be four terminals, two for each circuit. However, the transistor only has three terminals (i.e., the base, the collector, and the emitter). Therefore, one of the terminals must be common to both transistor circuits. The selection of the common terminal affects the output of the amplifier.

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