

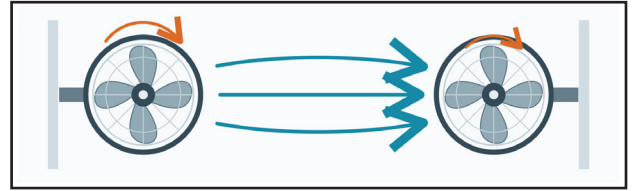
How Does a Torque Converter Work?

Let's start with two wall fans facing each other. If we turn one fan on, the air from this fan will start to turn the other fan, although at a much slower rate than the "drive" fan.

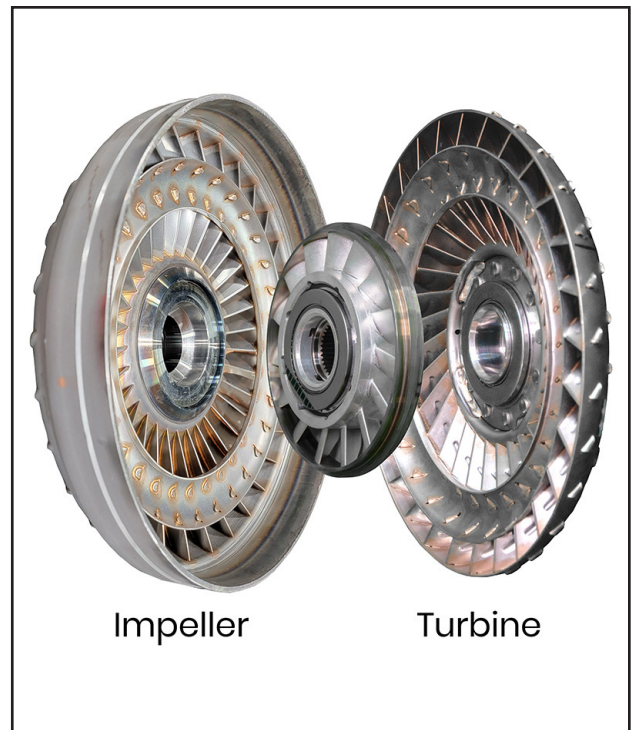
In the case of a torque converter, the drive fan (impeller) is connected to the engine, and the fan being "driven" (turbine) is connected to the input shaft of the transmission. In addition, oil is used to transmit the energy between the two fans, as opposed to air in the example scenario.

When a vehicle is stationary, such as at a stop sign, with the transmission in gear and engine at idle, the drive fan that is connected to the engine is spinning so slow that it will not transfer enough oil to turn the driven fan. As the vehicle's brakes are let off and the throttle is held, the engine speed increases, and the drive fan blows more oil at the driven fan. The driven fan then starts to turn and move the vehicle. This important concept is commonly referred to as fluid coupling.

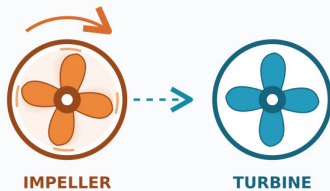
The drive fan will always turn slightly faster than the driven fan, just like the wall fans. If you were to stick a feather into the blades of the driven wall fan, the driven fan will slow down, but not the drive fan. In a real application, this is just like pulling a heavier trailer. The feather in the driven wall fan is essentially like adding a load to the vehicle.



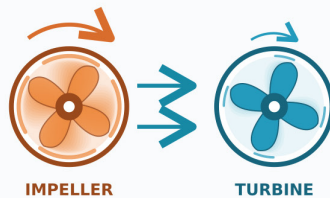
Airflow transfers motion between fans. The powered fan (left) pushes air, which makes the unpowered fan (right) start to turn.



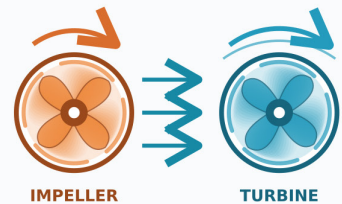
1 STOPPED AT IDLE



2 APPLY THROTTLE



3 FLUID COUPLING



1: At idle, the engine turns the impeller slowly, transferring a small amount of torque through the oil while the brakes hold the vehicle and turbine stationary. **2:** When the brakes are released and the throttle is applied, the impeller spins faster and transfers more energy through the oil to the turbine. The turbine begins turning, driving the transmission and moving the vehicle. **3:** As the vehicle gains speed, the turbine turns faster. This transfer of power through moving oil, without direct mechanical contact between the impeller and turbine, is called fluid coupling.