Torque converter Stall Speed

Torque converter stall speed is primarily determined by hardware components within the torque converter itself, not by software programming. Specifically, the size, blade angles (of the <u>impeller</u> and <u>stator</u>), and internal clearances of the torque converter dictate the stall speed. Here's a more detailed explanation:

• Hardware Components:

The main physical parts that affect stall speed are:

Impeller: This is the pump that spins with the engine's crankshaft and pushes transmission fluid. The angle and shape of its blades influence how much fluid is directed and at what force.

Stator: This component sits between the impeller and the turbine and redirects the fluid flow. Its design and blade angle play a crucial role in torque multiplication and stall speed.

Turbine: This component receives the fluid force from the impeller and transfers it to the transmission input shaft. The size and design of the turbine can also influence stall speed.

Stall Speed Definition:

Stall speed is the engine RPM at which the torque converter can no longer multiply torque effectively. It's the point where the impeller is spinning much faster than the turbine, and the fluid flow can't create enough force to further accelerate the turbine, according to Hughes Performance.

Tuning Stall Speed:

By modifying the angles and clearances of the impeller and stator, manufacturers can "tune" the torque converter to achieve a specific stall speed for a particular engine and application. For example, a high-stall converter might be used in a racing application where maximum torque multiplication at launch is desired, while a lower stall converter might be preferred for a street car for better drivability and fuel economy.

Software's Role:

While the stall speed is a hardware-defined characteristic, software can influence how the transmission operates in relation to the stall speed. For example, electronic controls can manage shift points and torque converter lockup strategies to optimize performance based on the stall speed and other engine parameters. However, these are secondary influences on the fundamental stall speed itself, which is determined by the physical design of the torque converter.