What Does Temperature Compensated Mean

By Dave McFarlane

When hydraulic oil changes temperature, the volume of the oil also changes. This volume change from a temperature reduction will create a vacuum in the oil chamber of the original Cessna uncompensated shimmy dampener. This vacuum will cause the oil to vaporize giving the oil a foamy expanded mixture that is compressible. The shimmy dampener action is then drastically degraded.

An increase in temperature will increase the oil volume causing a drastic pressurization of the dampener oil chamber. This pressure will force small quantities of oil past the dampener shaft seals. The decrease in oil will then aggravate any temperature reduction with increased chamber vacuum and related oil vaporization. This process explains why continuous servicing of the original shimmy dampener is required.

The temperature compensation system works by having a small chamber of oil that is spring pressurized through a very small passage into the main dampening restrictive orifice of the shimmy dampener. The spring-loaded oil chamber can adjust for oil volume changes as temperature changes. A similar system is built into your car shock absorbers. The temperature compensated hydraulic system requires very little service over extended periods of time and assures stable shimmy dampening action.