

TECH TIP

Fan Clutches Standard vs. Heavy vs. Severe Duty

One of the most common questions on fan clutches is, “What is the difference between a Standard Duty, a Heavy Duty, and a Severe Duty fan clutch?” The following TSB will attempt to shed some light on this issue.

First, we must understand the operation of a fan clutch. Normal operation of a fan clutch is to be engaged on start up. After a few minutes it should disengage and quiet down. When the air coming across the radiator reaches a set temperature, a thermal spring inside the assembly will turn, causing the clutch to re-engage.

When installing a fan clutch make certain that the clutch you are using is designed for your application. Fan blades with a pitch of under 2 ½”, require a Standard Duty fan clutch. Blades with a pitch of over 2 ½” can use either Heavy Duty or Severe Duty Clutches.

Standard Duty fan clutches are usually installed on cars and light trucks designed with good air flow. Due to minimal airflow requirements, the fan blade equipped on these vehicles, have a relatively low blade *Pitch*. The *Pitch* on a fan blade can be measured by laying the fan blade on a flat work surface. Measure from the work surface, to the highest portion of the fan blade. The pitch on Standard Duty fans is typically under 2 ½”. Since these blades are under 2 ½”, the fan clutch is designed to disengage with minimal resistance. These fan clutches are designed to turn the fan at 60 – 70% the speed of the shaft it is attached to.

Heavy Duty Fan Clutches are applied on vehicles with a higher demand for airflow. As you would expect, increasing the pitch on the fan blade will increase airflow. If the pitch of the fan blade is increased, the resistance on the fan clutch will also need to be increased. A fan blade with a pitch of 2 ½” or over, will require the use of either a Heavy Duty or a Severe Duty fan clutch. If the wrong fan clutch is installed, the fan may spin freely and fail to produce adequate airflow to cool the engine. Heavy Duty fan clutches turn the fan at 70 – 90% shaft speed.

Severe Duty Fan Clutches have the same operation as Heavy Duty fan clutches. The difference between them is in the “Working Area”. As a fan clutch spins, it creates heat, the larger the working area the easier the heat is dissipated. Severe Duty fan clutches typically have 65 sq. in. of working area, Heavy Duty clutches have 47 sq. in. of working area. Due to the larger working area, the Severe Duty fan clutch runs cooler providing a longer life expectancy.