Keep your belt on

The Austin Seven fan belt has a flat section and is of rubber and canvas construction, but a number of owners suffer from problems with belts wearing and chaffing or even jumping off the pulleys. A correctly set up fan belt running on good condition pulleys will give a surprisingly long life, very often lasting the life of an engine. This may sound like a fairy tale but in practice is quite possible. Before proceeding with the adjustment and maintenance consider why a flat section belt was specified. To obtain an efficient speed for the cooling fan without the camshaft pulley being excessively large, the fan pulley has to be quite small. This dictated the use of a very flexible flat belt because a vee section would struggle with the small diameter pulley.

Now what keeps the belt running true and stops it from jumping off the pulleys? To answer that we have to go back to the height of the Industrial Revolution in Victorian England when belts were the main form of power transmission. Engineers soon discovered that when wear on the drive pulleys changed their profile from flat to convex (curving out at the middle) the belt ran true and central. In other words a flat belt will always move to the highest point on the pulley, therefore if the pulley is of symmetrical convex section, then the belt will stay central. There is an excellent demonstration of this at most vintage steam rallies where the traction engines drive generators or other machinery using a long flat belt kept in position by the use of one or more convex pulleys. This works even when the belt is twisted or the direction is reversed.

Now, back to the maintenance. The pulleys are cast from a soft aluminium alloy and machined to a convex section with small rims. If the pulleys are worn flat then nothing will stop the belt from riding-up one of the rims and possibly jumping off. Next, correct pulley alignment is important, use a straight edge to check this, anything more than 1/8" misalignment will drastically shorten belt life. What can be done about pulley wear and misalignment? Well the worn profile can be restored but this needs considerable machining skill, so it is probably easier to fit new ones which are easy to obtain. Realignment of the pulleys can be difficult because most of the adjustment is restricted to the bottom pulley. The top pulley has very little movement because of the retaining split pin. Do not under any circumstances be tempted to remove this split pin, a top pulley coming adrift cuts a most effective hole through the radiator core. Adjustment must therefore be effected via the camshaft pulley. If it is out of alignment by being too far onto the camshaft then nothing can be done and a new pulley might be the answer. This can be adjusted by careful lapping the bore of the pulley and refitting to check alignment. When the pulleys are correctly aligned, fit a new belt. An old belt that has been stretched unequally from running on worn pulleys will never run true afterwards.

Tension the new belt only enough so that the fan blade can be turned by hand without undue effort, do not use any modern methods or ideas to judge tension, the belt is only driving the fan and so does not need to be very tight. When tensioning the fan belt you will notice that the top pulley can be swung towards the near or off side. Choose the direction that moves the fan towards the centreline of the radiator core, this will be the most efficient position for cooling purposes.

Later Austin Sevens used a steel rimmed fan pulley, in an attempt to counter the wear problem and perhaps the large rim was an effort to keep the belt in "true" position. This type of pulley can be fitted to earlier models but it can be a mistake to fit it in an attempt to correct alignment problems.

Eddie Loader