Technical hotline: 01405 760083

Tensions mount in engines

Careless handling of timing belts in the workshop can cause premature failure, with serious consequences for the engine, according to OE and aftermarket belt manufacturer Gates.

Crimping or twisting of a belt during the installation procedure might damage the tensile chords and these, along with other contributory actions add considerably to the number of belt failures each year.

With more than 100 million cars in Europe now fitted with a timing belt, Gates is telling garage proprietors and mechanics up and down the UK about the importance of setting the precise tension for each model. It says that the development of more technologically rich and efficient engines demands greater care with respect to belt replacement: "Never re-install the old belt, fit a new one and always replace worn pulleys and tensioners. False economies today can lead to damaged engines and expensive negligence claims tomorrow," says Andrew Vaux, District Sales Manager for Gates.

The operating tensions of belts have increased dramatically. It means there is no room for compromise.

"The installation tension of each belt must be set precisely. The experienced 'rule of thumb' is no longer your reliable friend," he concludes.

Very sound solution

Timing belt installation procedures have been revolutionized thanks to the introduction of the Gates STT-1 Sonic Tension Tester.

Belts and tensions can vary across a model range, according to drive layout and the engine performance required. That makes correct part numbers and accurate measurement of tension crucial to the duty cycle of the belt and the continued good health of the engine.

The STT-1 from Gates, makes accurate belt tension possible every time. It analyses sound waves (natural frequencies) from the timing belts through a sensor, is lightweight, easy to use and all the technician needs to do is key in the Gates belt reference number. The STT-1 compares this with pre-installed values for most popular European cars, which are stored in its memory.

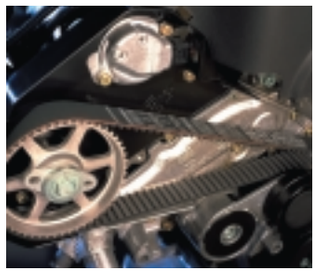
Updates are supplied on a chip

Better by design

Timing belts don't stretch, require no lubrication, can be positioned more accurately and are easier to install than chain drives. However, major belt manufacturers such as Gates can still only provide three of the four most critical elements that affect performance:

"These three elements are the cords that deliver the tensile strength, the jacket which protects the compound from heat/ friction and the compound, which is the substance that holds it all together," says the company.

While product enhancements continue to improve resistance to temperature/ wear/ flexibility, as well as increase strength and reliability, the one thing that can't be provided, but which is just as crucial to performance and longevity of the belt, is the correct tension.



Setting the correct tension remains the responsibility of the technician

Successful innovation

Gates has added significant OE successes to its vehicle installation portfolio for 2003. The new Audi A3, A4 and A8 models are equipped with Gates timing belts, tensioners and auxiliary drive belts. So is the latest Ford Fiesta. The recently launched Ford Street Ka uses auxiliary drive belts, tensioners and idlers supplied by the belt manufacturer.

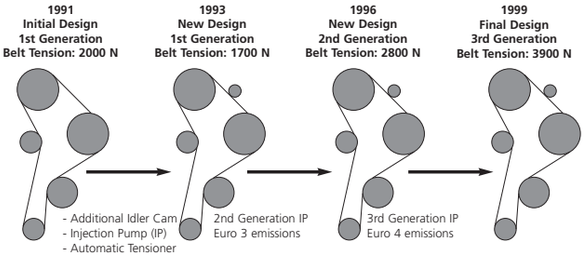
Compact modern engines operate at high temperatures and work under increased load. For example, diagram 1 shows changes in engine design to accommodate Euro 3 and Euro 4 emission standards plus drive layout changes (e.g. new idler, tensioner, injection pump) during the design period to 1999. Operating tension rose from 2,000 to 3,900 Newtons, yet the duty cycle of the timing belt actually increased from 60,000 to over 120,000 kilometres.

There are similar stories with respect to petrol-driven engines.

Such performance is possible because belt manufacturers like Gates are committed to investment in new materials and belt designs in order to deliver the changing expectations demanded by vehicle manufacturers.

So that's how Gates knows that the correct tension of a timing belt is so critical to engine performance

4 Cylinders Direct Injection Diesel Evolution and Timing Belt Performance Improvement



Timing Belt Durability			
60,000 Km Gates Timing Belt GD 1	90,000 Km Gates Timing Belt GD 2	90,000 Km Gates Timing Belt GD 3	150,000 Km Gates Timing Belt GD 4