



# SPLIT DIE

**The Gates technical inspector uncovers an unknown timing belt issue for a particular engine and underlines a call for a formal inspection procedure.**

## CASE STUDY I

**Vehicle:** Citroën  
**Model:** Berlingo  
**Engine:** 1.9 Diesel

### FIRST SIGHT

The timing belt had been replaced at the scheduled interval, but within a month, it had failed. It looked like a simple enough diagnosis when the Gates advisor arrived.

Many different factors can contribute to the premature failure of a timing belt:

- If it has been 'crimped' the structure can be damaged and tensile failure can take place.

- Contamination of the drive system by foreign bodies such as dirt, oil or water will cause belt damage and tensile failure.

- A damaged cover or its incorrect fitment may allow contamination or cause direct abrasion to the edge of the belt, causing it to fray.

- If the installation tension of the belt is imprecise — either too tight or too loose — premature failure is almost inevitable and the evidence in either case will be strong.

- If the belt has been specified incorrectly, the manufacturer's recommended procedure not followed properly, or if an update to the installation procedure has been

overlooked, it may lead to premature failure.

None of the above was a factor in this case. Another known cause of premature belt failure is a worn tensioner or a worn pulley. The securing bolts have been known to shear, the guides on the pulleys can break and bearings can fail. It's fair to say that pulleys or tensioners are the prime suspects in most technical investigations of this nature. In this case, a replacement tensioner had not been fitted.

### DISTINCTIVE DESIGN

The tensioner on this particular engine model is distinctive. It is made in two parts, which are riveted together. The two halves had parted, ultimately leading to a belt failure. But this was not the end of the story.

### ALL KITTED OUT

Gates always recommends that all of the metal parts should be replaced at the same time as the belt. In association with an itemised inspection of all the other components, it forms part of a drive system overhaul. A Berlingo belt kit was fitted and the problem was resolved.

### WARNING BELLS

When there was news of belt failure on another Citroën Berlingo, this time where the tensioner had been replaced, it rang warning bells with one of the specialists in the Gates technical department. On this

