

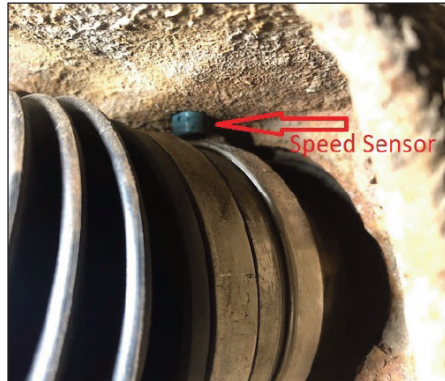


Tim Stock

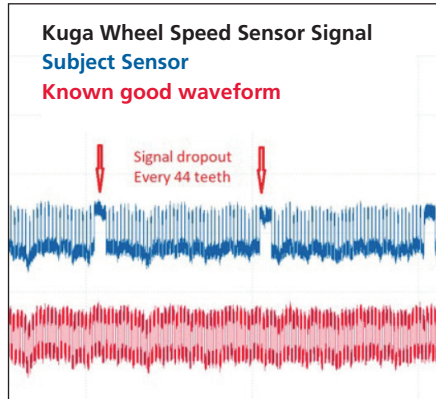
Going in deep to diagnose a Kuga wheel speed sensor fault

The Helpline recently received a call regarding an issue with an ABS fault on a 2010 Ford Kuga 2.0TDCi. The Kuga had a fault code recorded of C1144 - Tone ring missing tooth. The technician, being very experienced, followed the usual process of confirming, testing and then repairing.

The first step was to use his Picoscope to see the signals from both rear speed sensors. This showed the tech an obvious signal error from the right rear wheel speed sensor. The signal showed a cyclic drop in the signal every 44 teeth. As the Tone ring is enclosed, no visible inspection was possible. The technician fitted a



The wheel speed sensor was positioned over the axle shaft



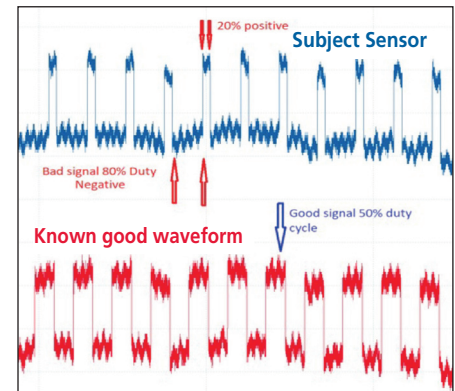
A signal dropout at every 44 teeth suggested a broken tooth

new drive shaft, as this was the obvious answer. Unfortunately, it did not resolve the issue and the signal still showed a cyclic dropout ever 44 teeth. It was time for a closer inspection.

When zoomed into the signal trace, it was seen that the duty cycle of the bad sensor trace was different to the correct sensor trace. A 50% duty was present on the correct signal, but an 80% negative duty was present on the bad side. This gave us some suspicion of possibly a bad sensor or control module fault. We suggested that the suspect sensor be moved to

the left rear loom and retested. The abnormal trace moved to the left rear with the sensor, leaving no doubt that the sensor was faulty. A new sensor was fitted, the fault was cleared and a road test confirmed all was good.

It was suspected the ECM was picking up on the signal error and possible resetting the ground every 44 teeth. As the signal was so precise in the dropout failure, only a module could control this.



The duty cycle (pulse width) on the subject sensor was different from a known good signal