

LIN - A poor man's version of CAN



Tim Stock, Helpline

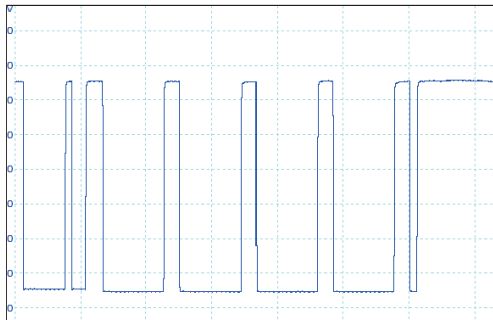
Recently we have had calls from garages with charging problems on various brands.

A 2016 Ford Focus TDCi came in with a charging problem. After some preliminary checks, the garage decided the alternator was faulty and a genuine replacement was fitted. Codes were cleared, but the charging system still showed a fault and was not charging.

This car has a Local Interconnect Network (LIN) controlled alternator, with single wire control. As the garage has no experience with this system, the helpline was called. After a little research, it was found that the circuit for the LIN has 3 items present: the alternator, PCM and the active grill. So time for the Picoscope to come out.

LIN is a single wire 12 volt based network. We know what the signal should look like, so we sent the garage a waveform for their reference, The signal they had was not as expected.

As the alternator had already been replaced, we applied our attention on the other components on that LIN circuit. On closer inspection of the connection



A normal LIN signal ranges between 2 and 10 volts

at the grille shutter motor, severe corrosion and water ingress was found. With the grille disconnected, the LIN signal returned to normal and the charge rate was back to normal. This was not the first time we have seen this problem on a Ford Focus.

On some vehicles, this LIN circuit will also include the Intelligent Battery Sensor (IBS), that monitors the battery state for stop/start systems and alternator feed back.

As manufacturers are using LIN as a cheaper, alternative network solution, we will be seeing more of these problems because LIN only has a single wire to communicate. Any fault on this circuit will cause total failure.

We typically get calls on the help line every week relating to LIN problems, many relating to Windows systems. Also, LIN door module controllers can be exposed to water ingress on many makes/models.

Yet again we come back to the same conclusion: a scope is an essential tool for modern diagnostics, even for something as simple as a charging fault.

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Peter Kennedy
Kennedy's Garage

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