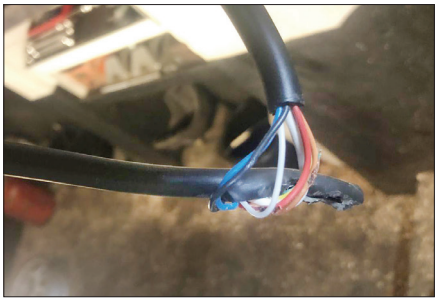
New towbar causes a breakdown

A customer rang me while he was broken down on the motorway. The engine had cut out as he was driving, immediately after he had applied the brakes. Luckily enough, he was able to coast to the hard shoulder without incident. Once stopped safely off the road, the car would not start at all, and the shifter was locked into the Park position. He rang me, and I was able to describe how to remove a small access cover next to the shifter, and use a screw driver to allow the shifter to move it into Neutral. Once in Neutral, he was able to start the engine, but there were multiple warning lights on the dash. He returned home and dropped the Mazda off to me so the problem could be sorted.

Among the numerous fault codes, there was one that I began paying more attention to, remembering I had seen that the brake lights had not been working a few days earlier. The fault code was relating to Circuit A of the brake pedal switch. A wiring diagram showed that the brake pedal switch had two contacts. A quick look at live data showed that only one of the switches seemed to be working.

The wiring diagram showed there were 4 circuits powered from the switch: Engine ECU, Start/Stop Control Module, Rear Body Control Module, and the High Mounted Brake Light. I made a few checks by disconnecting the ECU and checking



Poorly routed towbar wiring had melted onto the exhaust, causing the breakdown

fuses. Everything looked fine at first. I was thinking on what to check next and talked to the customer again, getting a few more details and information.

By sheer coincidence, a short time before his breakdown, I was behind him as he drove along a local road. I realised his brake lights did not seem to be working. When the customer said that he had a towbar installed recently, this made me think of the brake light problem, and it's possible connection to this problem. The towbar was a type that swung up out of view under the rear bumper while not in use, so it wasn't obvious it was there until I looked for it.

I examined the wiring for the brake lights, especially the wiring that had been installed for the towbar. From what I could see, the 7 pin connector for a trailer had been tapped directly into the wiring at the rear of the Mazda. I did not see the trailer lights routed through a module of any type. The hitch was stowed up and out of the way, and the wiring for the 7 pin socket was stuck, melted onto the exhaust. Additionally, there was only one tie wrap on the new wiring harness. The installer had not considered where the wiring would end up when the towbar was stowed. Not much care had been taken by the installer. This is always a recipe for problems down the line.

Bernard Clarke, Clarke's Garage

Insulation on the wiring had melted to the point that the brake light power supply in the loom had been shorting to ground. Initially, this probably only caused the brake lights to stop working, as he did not have any running problems.

Over time, and on the longer drive when the breakdown occurred (when the exhaust was certainly hotter than on shorter trips), the shorting progressed until it caused disruption with the Engine ECU, and caused the engine to cut out. Once the wiring was repaired and re-routed, the fault was cleared and the Mazda was back to normal running.