Faulty wipers on a Hyundai Ioniq

Tim Stock,
Autobiz Helpline

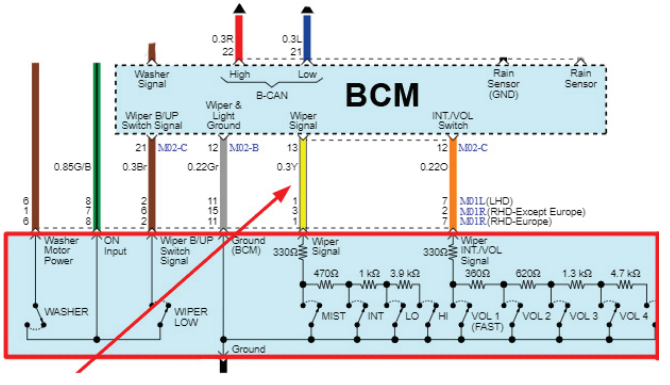

Fig. 1 The wiper control signal (yellow wire) to the Body Control Module (BCM) is changed by varying resistance to ground

A recent call to the Autobiz Helpline, was for non-operational front wipers on a Hyundai Ioniq. A previous workshop had spent considerable time and numerous parts chasing this problem, without any solution.

The mistake is a common one, with many garages not researching or understanding the system, before taking on the diagnosis. Time spent obtaining diagrams and system layout is time well spent, before any physical testing is started.

The original workshop started by replacing the wiper motor assembly, with a used part. They replaced the multiplug connector at the same time. Then they replaced the wiper switch. These were all used parts, and the problem persisted. Losing faith in the original garage, the customer pulled the vehicle from them, and sent the Ioniq to another workshop.

Researching the system informed us that the wipers are controlled by the body control module, which operates independent relays in the engine bay fuse box. The body control module outputs a positive to either the low-speed relay, or to the high-speed relay. Both relays share a common ground.

The stalk for wiper control was already exposed

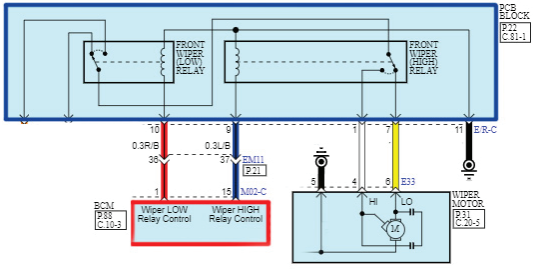

Fig. 2 The wiper control signal (red and blue wires) passes through relays, which provides the desired command to the wiper motor (yellow wire)

from the previous workshop testing, so we decided to test here for a control signal. This would be a changing voltage signal, as the wiper switch modifies the ground via various resistances, as shown in Fig. 1:

- A 330 ohm resistance would be grounded for the Body Control Module (BCM) a command for a single wipe.
- Adding another 470 ohms provides an intermittent request to the wiper motor.
- Another 1K ohms requests wiper speed 1.
- Another 3.9 K ohms requests wiper speed 2.

An alternate diagnostic process could be a serial data check in the BCM, to check the wiper command status.

Checking the BCM showed the commanded wiper status signal was correct, so we checked at the relay module in the engine bay. Both input control signals tested good for both speeds. Powering the wiper motor circuit from the relay unit directly, proved the motor was working correctly on both speeds. Power supply to the relay modules was tested and proved good. So, we condemned the relay module as being faulty, as it was receiving the correct commands and not relaying them.

The relay module is a separate component to the fuse box. When the relay module was replaced, and all wiper systems returned to a working properly.