

# Modern Automotive Lighting



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Learning for life

Device	Connector Pins	Voltage		Comments
		Ignition On	Ignition Off #	
Turn FL	1 - 1'	>10V / 0V	0V	
Park FL	2 - 2'	>10V	0V	
Lo Beam FL	3 - 3'	>10V	0V	
Hi Beam FL	4 - 4'	>10V	0V	

## Fault Diagnostics

Automotive technicians need to understand, diagnose, and repair the complex systems used in modern vehicles.

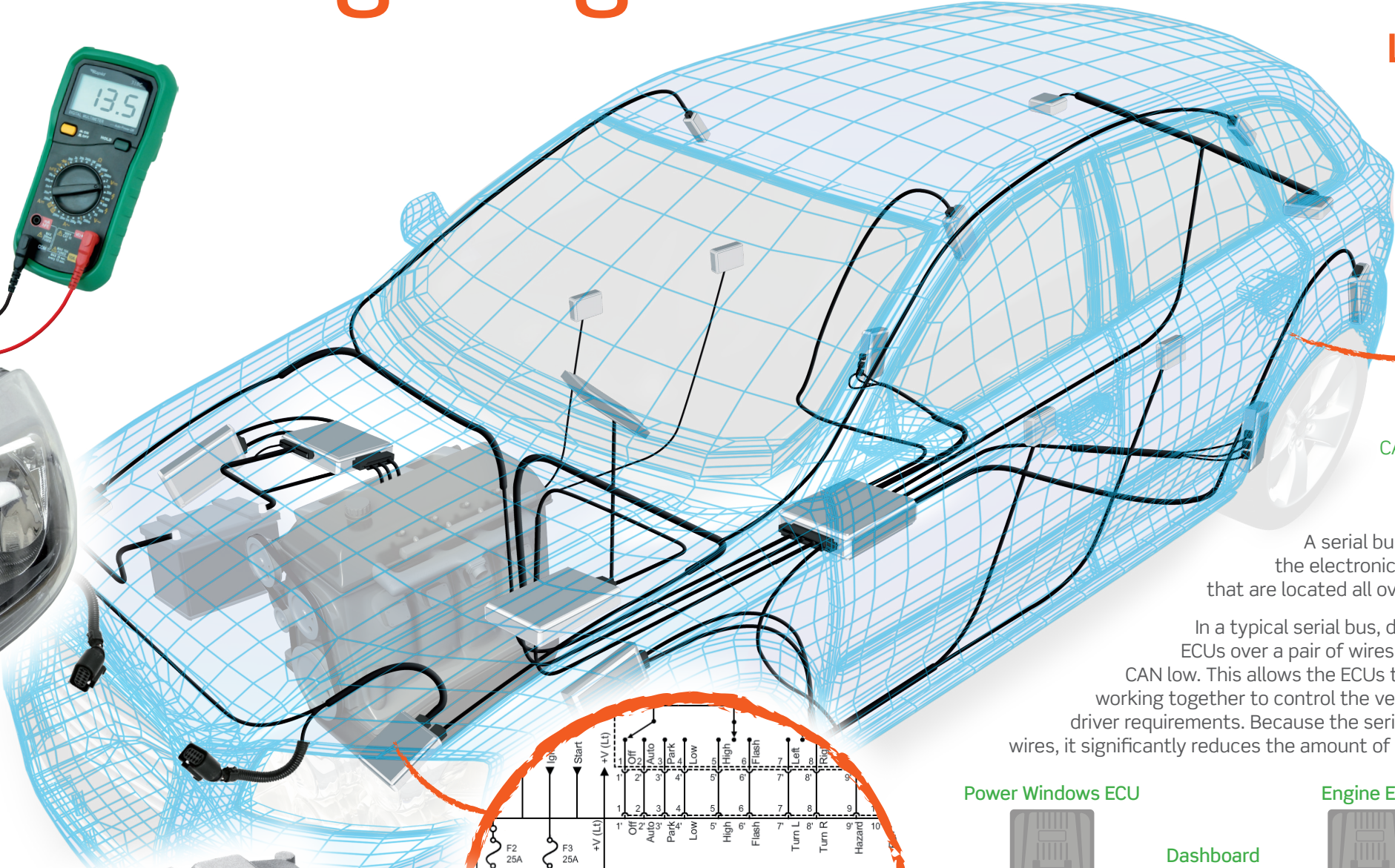
Typically, the technician follows a formal diagnostic procedure:

- The starting point is to verify the problem reported by the customer.
- Next they inspect the vehicle and test its operation.
- They then use a scan tool to retrieve diagnostic trouble codes.
- Often the technician refers to manufacturers' technical manuals and service bulletins for known problems.
- The test results and data are then evaluated.
- Eventually, the cause of the problem is isolated.
- Once the cause is finally confirmed, a repair procedure is performed.
- Diagnostic trouble codes are cleared, and a retest is carried out to confirm correct operation.

701-02 Modern Automotive Lighting Trainer

ECU

Diagnostic Scan Tool



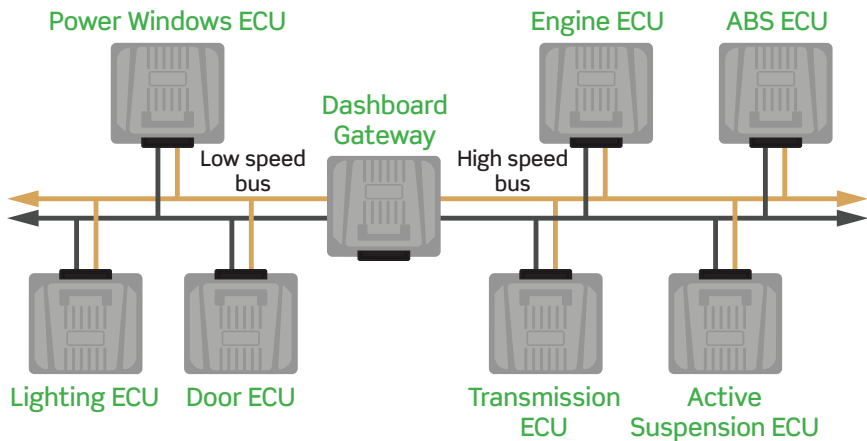
CAN low

CAN high

## Serial Bus

A serial bus connects together the electronic control units (ECUs) that are located all over a modern vehicle.

In a typical serial bus, data travels between ECUs over a pair of wires called CAN high and CAN low. This allows the ECUs to share information, working together to control the vehicle and respond to driver requirements. Because the serial bus only uses two wires, it significantly reduces the amount of wiring in the vehicle.



## ECU

An Electronic Control Unit is a computer that is specifically designed to work in a vehicle. A modern vehicle may have up to 100 ECUs, each with a dedicated task. Some tasks, such as controlling the engine, need to happen very quickly. Therefore the engine ECU operates on a high speed bus. Other tasks, such as operating the lights, are less time-critical, so lighting ECUs operate on a low speed bus.

ECUs are programmed to perform instructions. They listen to commands from other ECUs, monitor sensors (such as a light switch), and control actuators (such as a high beam lamp).

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