



Trailer plugs and extra lights can cause BCM trouble if not wired correctly.

## Ford Ranger PX I & II / Mazda BT50 UP/UR : BCM and Lighting Circuits Troubles

**The Ranger and BT50 from 2011 on has been a successful collaboration between Ford and Mazda. These vehicles share the same platform with the only significant differences being the external panels and some peripheral options. As the owners of these vehicles are the outdoorsy types, they like to add equipment like trailers plugs, bigger driving lights, canopies and other random camping gadgets. This habit is where the trouble starts, as you must be careful how you wire up these additions otherwise there are unexpected consequences. This article will give you the precautions you need to avoid the trouble.**

### BCM

Like most other modern vehicles the Ranger/BT50 uses a Body Control Module (BCM) or Body Computer. As the name suggests, the BCM is an electronic control unit that controls many vehicle systems not directly related to the engine or drive train. The BCM is connected to all of the other control units in the vehicle by the CAN bus system, as many signals are shared between them.

The BCM is a combination of an ECU and a relay / fuse box. This allows it

to switch circuits ON and OFF, control the amount of current supplied and coordinate the timing of various actions. The advantage of systems like this is that it removes many of the separate module and wiring that was required in previous models and allows for extra functions like onboard diagnostics for the circuits that it controls. The BCM incorporates many conventional and solid state relays and fuses. However, these relays are built into the module and cannot be replaced individually, which is a disadvantage. The BCM is mounted under the dashboard on the driver side.

These vehicles are popular with people who like to tow trailers, horse floats, caravans and boats. The higher spec models (XLT and Wildtrak) come with factory fitted tow bars and trailer plugs, and there are very few problems encountered. The base model (XL) does not, and this is where the trouble can start if you do not understand the system.

### BCM Emergency Function

The BCM has an internal monitoring function which sends a signal at regular intervals. If this signal is not sent or received after a specified time, the BCM will enter emergency running

mode. This mode is indicated by virtually all vehicle functions stopping except the following;

- Stop lights
- Horn
- Wipers at one speed only
- Low beam headlights will come on even if the light switch is in the OFF position.
- The engine might still run, but we are unable to confirm

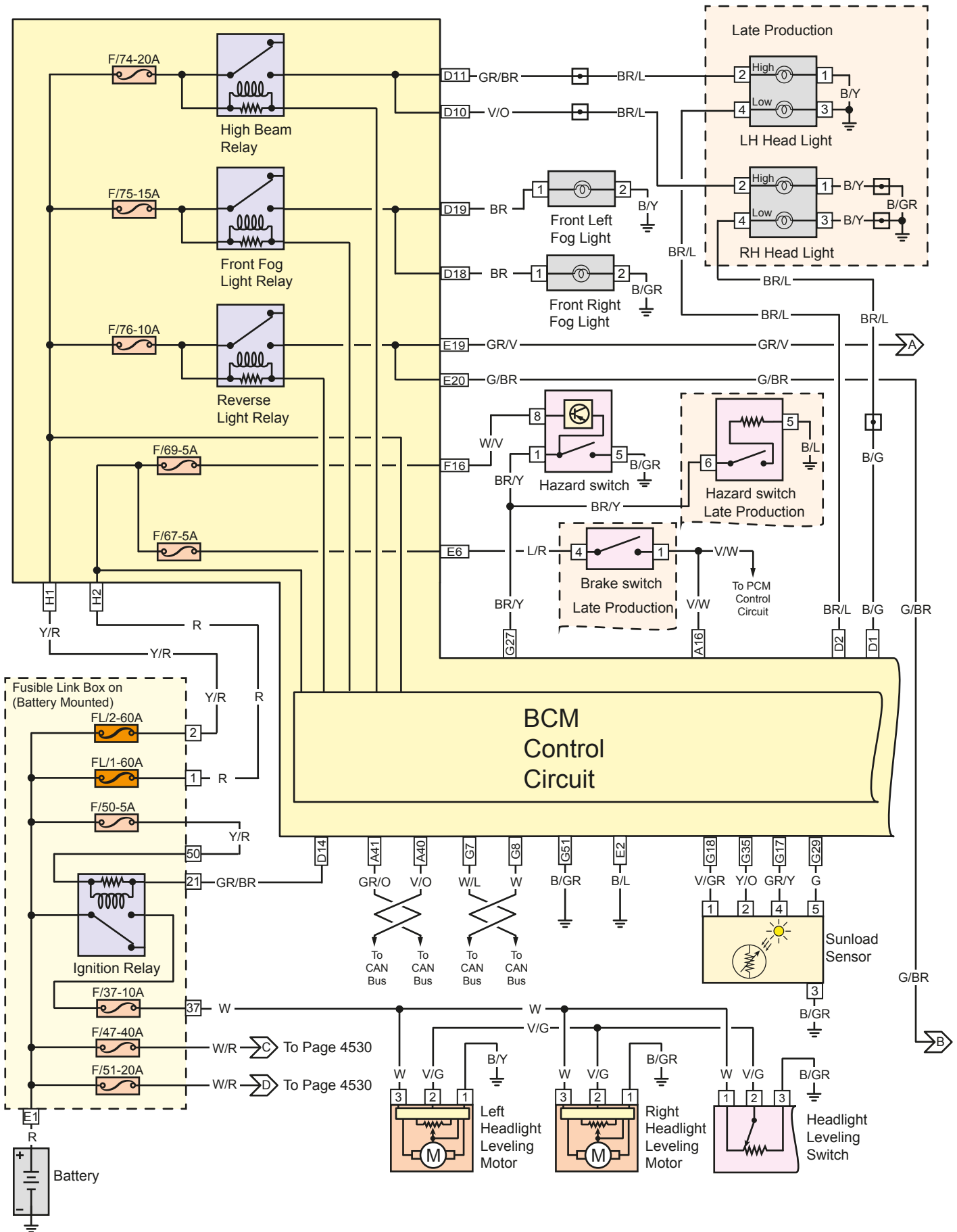
Once the ignition is turned OFF, the BCM will try and reset itself. If it does not receive the correct signal, it will prevent the vehicle from being restarted. The BCM also has an overload function to protect itself from an excessive current draw. This overload function will also shut down the BCM, but not as extreme as the emergency function. We have been receiving reports of these vehicles having trouble with Low beam headlights not working or indicators not flashing. The possible causes are as follows.

### Trailer Plugs

The factory fitted systems have a "Trailer Towing Module" installed which connects to the CAN bus system of the vehicle and then draws power ▶

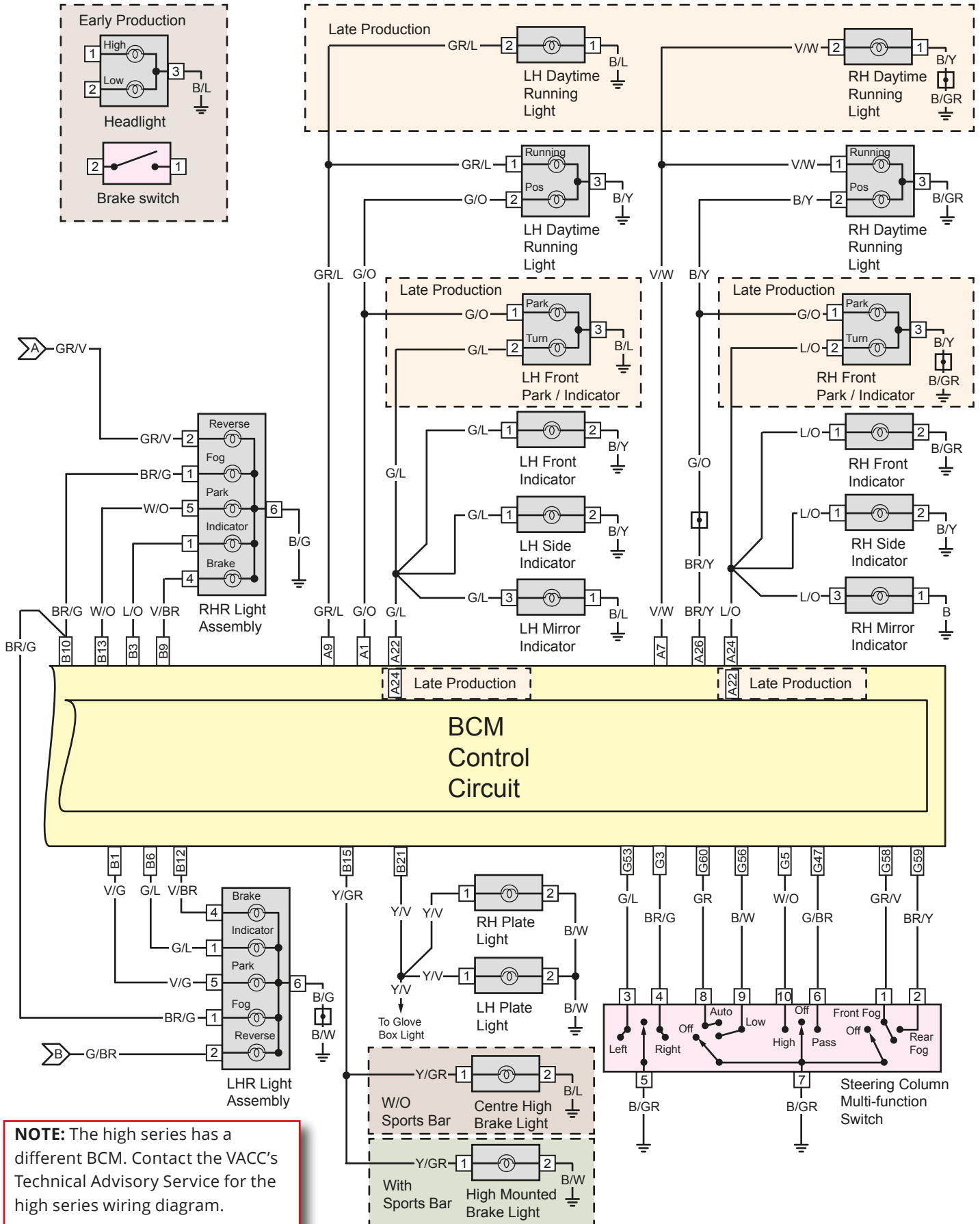
# Ranger PX I & II Lighting Wiring Diagram (Low Series)

Note: The BT50 will be similar but not exactly the same.



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**NOTE:** The high series has a different BCM. Contact the VACC's Technical Advisory Service for the high series wiring diagram.

from the vehicle in a way that the BCM can control. If you try and wire your own trailer plug by splicing into the lighting wiring loom, the BCM will detect the extra current draw on the circuits and will at best, log a trouble code and at worst will enter into emergency mode to protect itself.

Trailer Towing Modules are available from Ford and Mazda dealers or there are other aftermarket options (not recommended by the manufacturers). They connect to the vehicle's harness and are mounted under the front passenger's seat. Once fitted a compatible scan tool is required to configure the vehicle to operate with the new module.

### Additional Lighting

If you wish to install addition exterior lights, it is recommended that you use the "Trailer Towing Module" to control them (such as the parkers and indicators on a bull bar). Any extra driving lights should have their own power supply via a relay, an auxiliary fuse and an appropriate switch. To energise the switching coil in the relay for the driving lights, a signal wire can be connected to the headlight power feed wire of the vehicle.

### BCM Reset

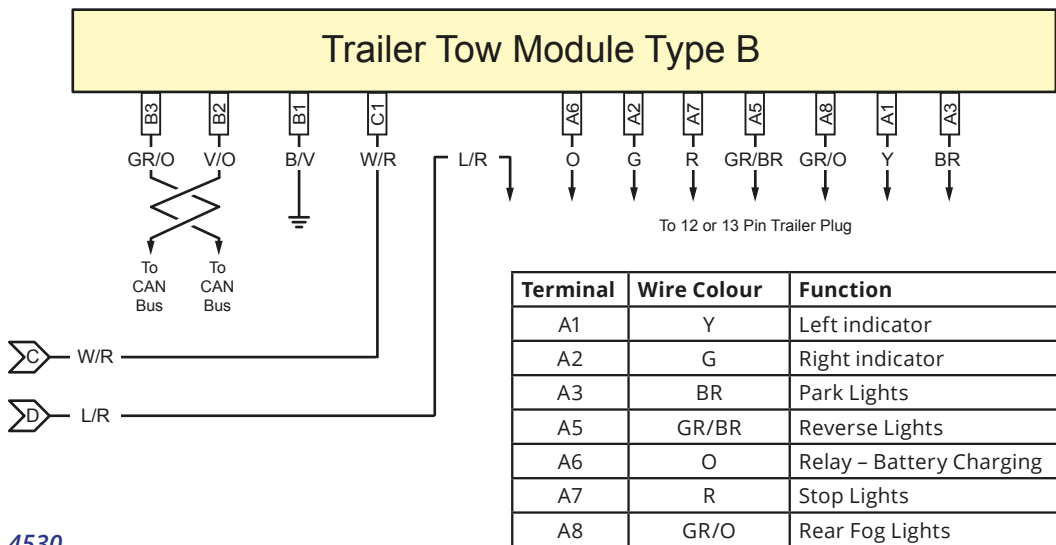
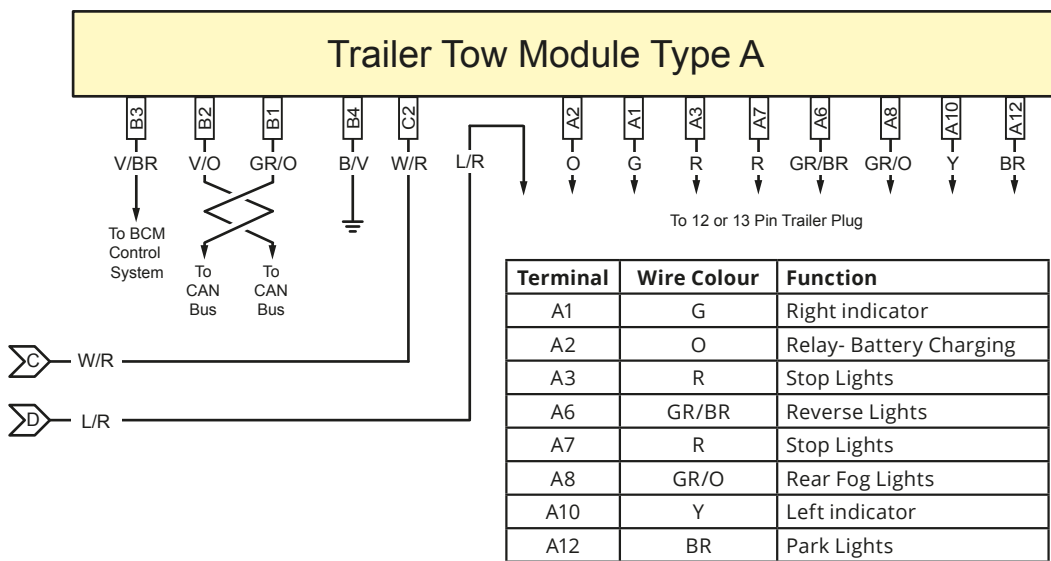
As mentioned earlier the trouble with low beam headlights not working, indicators not flashing or anything else that is controlled by the BCM not working, usually comes from nonstandard optional extras.

The typical troublemakers are addition lights fitted incorrectly, globes with larger wattage fitted and trailer plugs without the appropriate control modules. There is also reports that fitting LED globes are causing issues (it can be done, but it requires the correct kits to do so).

If the BCM senses additions loads or a fault in any of its circuits, it seems to be able to shut down those circuits and record a DTC. Once the circuit is repaired, the BCM can be reset with a compatible scan tool, the fault code can be cleared, and if you are lucky, the BCM and the circuit should work correctly.

**WARNING:** We have heard reports that you can only reset the BCM **ONCE**. If it is tripped again, it will shut down permanently, and a new unit will be required. ▶

### Trailer Tow Modules Type A and B

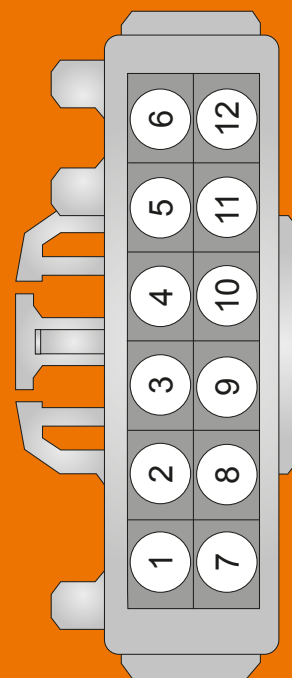


### Connector A

There are two possible types of Trailer Tow Modules.

Connector A for both modules is the same (see below).

However, the terminal pinouts are different (see tables to the left).



### Trailer Patch Harness for LED Trailer Lights



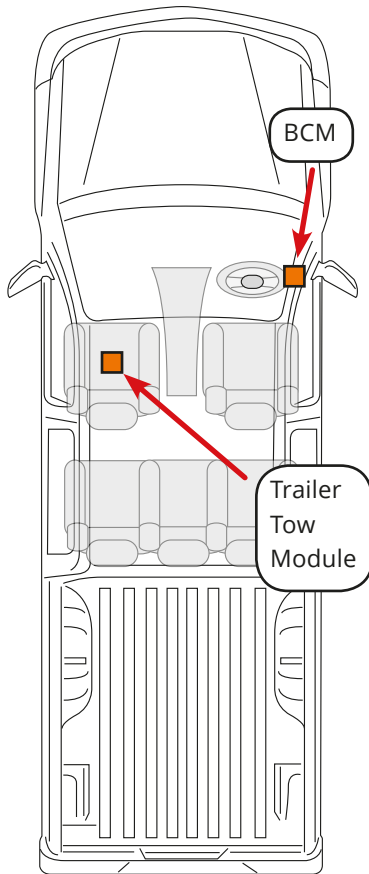
If you have a trailer with LED light globes, they may start to flicker if they require less than 2 watts to operate. There is a trailer patch harness available which will allow the lights to operate correctly which is available from dealerships.

### Allowable Globe Wattage

If you go above the wattage specifications below, the BCM may not like it. If you are having issues, check the globes and return them to standard.

Lighting Circuit	Vehicle Globe Wattage	Trailer Module Globe Wattage
No. Plate	5	28
Position / Parker	5	28
Indicators	21	24
Brakes	21	28
Reverse	21	24
Rear Fog	21	48

### Module Locations



**WARNING:** Do not use the negative battery terminal as an earth point for additional electrical equipment or loads. These vehicles have a Battery Monitor System (BMS) which has a sensor on the negative battery terminal. If there is any equipment earthed directly to the terminal, the system will not measure it. As a result, the BCM which controls the charging circuit may not fully charge the battery, which will cause starting problems. Always earth additional electrical loads to the body.

### How to modify your vehicle safely

On the Ford Australia website, there is a document called the "Body and Equipment Mounting Manual Ford Ranger 2015". This will give you all the information you need to make modifications and additions to your vehicle safely (I could not find an equivalent Mazda document). It is a PDF file, and it is free to download at the following address.



Body and Equipment Mounting Manual  
FORD RANGER 2015

Date of Publication: 05/2016

<https://www.ford.com.au/owners/vehicle-support/body-equipment-manuals/>

For more information on Ford Rangers and Mazda BT50, log on to Tech Online or call the VACC's Technical Advisory Service.



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