# MP3818B

**13 PIN PRE-WIRED 2M TOW BAR WIRING KIT WITH SEVEN WAY ZR2500 BY-PASS RELAY (with audible sensor) AND VOLTAGE SENSING 30AMP BATTERY CHARGING RELAY**

For use where the direct connection of towing electrics to vehicles may affect bulb failure monitoring, multiplex wiring, or other electronic systems. When wired as below the relay switches power directly from the vehicle battery to operate the trailer lamps using very small signals from the towing vehicle lighting circuits. This current is not detected by vehicle monitoring or switching devices. Additionally, it is capable of detecting, analysing and rerouting modulated signals present on an increasing number of modern vehicles which would otherwise cause incorrect lighting operation, dimming and even non-functioning of bulbs.

**FITTING INSTRUCTIONS**

- Suitable for 12v negative earth vehicles only.
- Examine the car carefully to see that all electrical and electronic circuits are working correctly and that no warning lights are showing.
- Decide whether to disconnect the car battery, or remove fuses, always follow the vehicle manufacturer's instructions. Take into account: Would disconnection disrupt memory circuits, alarms, engine management, audio etc. You may need a device to maintain these circuits if the battery is disconnected.
- The use of digital multi-meters or high impedance testers is essential if installing on digitally controlled or multiplexed lighting systems

The relay should be fitted in a dry ventilated space, in a position providing protection from physical damage and close to the trailer socket, usually on the nearside of the vehicle and should be secured to the vehicle with adhesive pads, screws or cable ties with drip loops formed in the cables both sides of the relay.

Screw-less terminal connections: Remove 1cm of the wire sheathing and twist the copper strands together. Depress the lock button releasing the spring contact inside the terminal. Insert the twisted wire core to the backstop inside the terminal block and release the button.

1. Locate the wiring to the rear lights of the vehicle (usually on one side of the vehicle) and select a suitable point at which to mount the By-pass relay and make the necessary relay and towing socket cable connections. Connections must be made to conductors carrying the supply to the bulbs.
2. If access for the socket cable is not provided, drill suitable holes in the boot floor, close to the socket mounting point on the tow bar, taking care not to damage wires, pipes or vehicle bodywork. Remove any sharp edges from the holes with a file, treat with rust inhibitor and fit suitable grommets.
3. Feed the cable from the towing socket through the grommets to the area selected for location of the relay and secure.
4. The **White** wire of the **12 core cable** must be connected to a good earth. **Earth** connections can be made to the vehicle chassis or bodywork using the Blue ring terminal provided, a good connection is important, this should be bare metal, free from paint or rust.
5. **Relay Terminal 0V** - Connect to the vehicle chassis earth using the Blue ring terminal provided, not to a vehicle earth wire.
6. **Relay Terminal +12V** - Connect the 5m Red cable (2.0mm$^2$) from the battery using the Yellow insulated ring terminal or a spare fuse terminal not controlled by the ignition switch, fitting a 15 amp in line fuse holder with Yellow insulated terminals close to the battery. The cable should be routed where it will not be cut or crushed, particularly attention should paid to places where the cable passes through bulkheads etc.

After fitting the fuse, use a multi-meter check the +12V supply to relay terminal +12V and then remove the 15A in line fuse.

**Relay Terminal C2 -** The relay is equipped with an internal buzzer to provide an audible signal when the trailer indicators are working correctly. Alternatively a dashboard warning light or external piezo buzzer can be connected to terminal C2, the other terminal of the lamp/buzzer should be connected to earth.

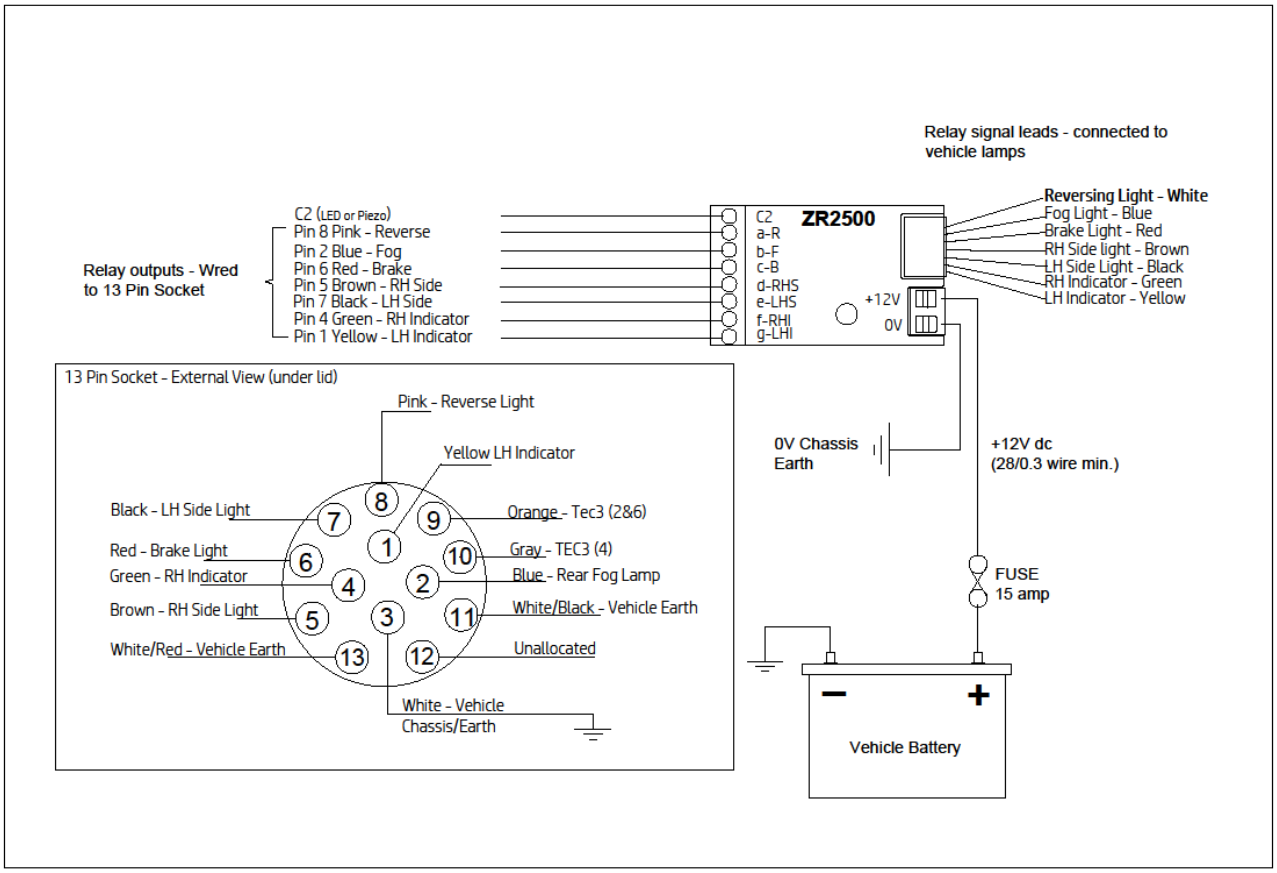
The 7 long signal wires of the relay must be connected to the individual vehicle rear lamp circuits avoiding any multiplex or data cables, Blue snap connectors are provided. Identify the function of individual vehicle rear lamp wires by tracing back to the bulb holder or using a digital multi-meter or high impedance tester.

**Notes**

- For a common tail & brake wire combination using a pulse modulated supply, connect only the red signal lead to the car harness, insulate and tape up the brown and black relay leads.
- The relay has short circuit protection for all seven lighting outputs. If a short circuit is detected, the individual output is automatically turned off without blowing the supply fuse until the fault is corrected. The circuit will then be automatically be re-connected when the fault has been cleared.
- If connections for the offside indicator and position light cannot be made adjacent to the relay, a 3m twin cable and 2 Blue snap connectors are provided to extend the relay signal wires across to the nearside of the vehicle.

| Socket pin No. | 7 core cable colour | Circuit | Relay Terminal Number |
|---|---|---|---|
| Pin 1 | Yellow | Indicator L/H | g-LHI |
| Pin 2 | Blue | Fog | b-F |
| Pin 3 | White | Earth Return | |
| Pin 4 | Green | Indicator R/H | f-RHI |
| Pin 5 | Brown | Position R/H | d-RHS |
| Pin 6 | Red | Stop | c-B |
| Pin 7 | Black | Position L/H | e-LHS |
| Pin 8 | Pink | Reverse | a-R |

| Relay Signal Wire Colour | to | Vehicle Circuit |
|---|---|---|
| Yellow | | L/H Indicator |
| Blue | | Fog Light |
| | | |
| Green | | R/H Indicator |
| Brown | | R/H Position light |
| Red | | Brake Light |
| Black | | L/H Position Light |
| White | | Reverse Light |



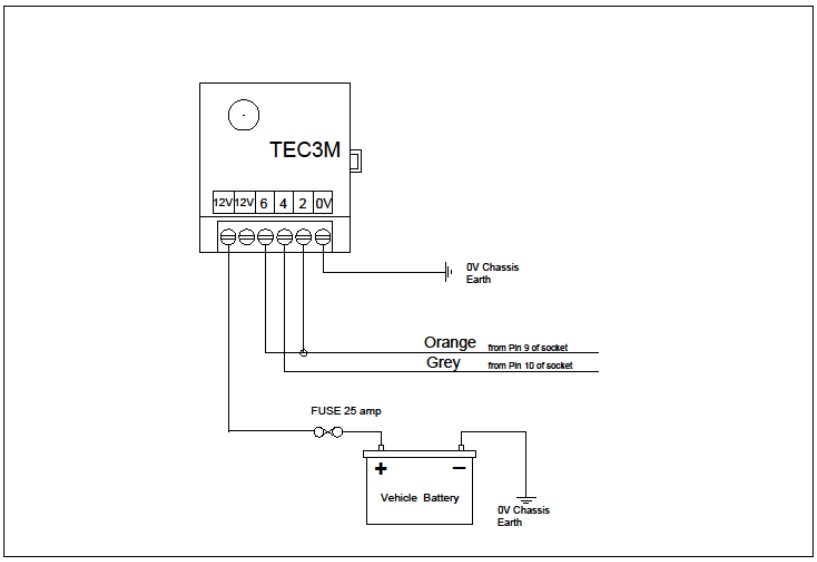

7. Check all wiring connections and if correct, reconnect the battery, start the engine and replace the 15A relay fuse. The relay will emit one audible tone and is now ready to operate with the vehicles lighting circuits.
8. Turn ON and OFF the vehicle road lights in the following sequence, side lights, brake lights, left indicator, right indicator, fog lights, reversing light and parking light. As each vehicle rear light function is turned on, test with a multi-meter or automotive electrical tester that the correct socket output pins are energised +12V
9. Connect a socket tester or auxiliary lighting board. Turn ON and OFF the vehicle road lights in the following sequence, side lights, brake lights, left indicator, right indicator, fog lights and parking light. Check that both the vehicle lights and the auxiliary lights function correctly. Auxiliary indicator lamps should flash in unison with vehicle indicator lamps and the buzzer / panel lamp should operate. If any lamp fails to operate, check all wiring connections and the bulb. The buzzer or panel lamp will not operate if the auxiliary lighting is not connected or if the auxiliary indicator lamps fail.
10. Vehicle fog light cut off function – A sequence of fog light switch operations will allow use of the trailer fog light with the towing vehicle fog light switched off.
    With the trailer connected
    - Switch ON the fog light – Both vehicle and trailer fog lights will be ON
    - Switch OFF the fog light – The vehicle fog light will be OFF – The trailer fog light will be ON and the relay will emit an audible tone every minute to remind the driver that the trailer fog light is ON
    - To switch OFF the trailer fog light. Turn ON and then turn OFF the vehicle fog light or switch OFF the vehicle side lights.
11. C2 output - When the operational tell-tale audible buzzer operates, the "C2" terminal will be energised +12V. This output is designed for use with a piezo sounder or LED dashboard warning lamp.
12. The relay installation should now be "load" tested by connecting a lighting board or tester and operating all of the vehicle rear lighting circuits simultaneously. Cables, connectors and fuse holders should be checked for "cool" operation. All lighting functions should be observed to work normally.
13. Bulb failure warning lights will only operate if a fault occurs on the towing vehicle, with the exception of indicator circuits trailer lamps are not monitored.

## FITTING INSTRUCTIONS FOR TEC3M

This combination caravan relay automatically senses battery/alternator condition and load demand, and switches current from the car's battery to the caravan's battery, fridge and internal lights via its own split charge relay. Sensing is automatic and does not require the use of a separate lead from the ignition switch.
The relay has been constructed to not only handle up to 30 amp loads, but it will also handle smaller loads from conventional caravans and still sense and process the load correctly.

- Do not connect unit to the mains. Suitable for 12v negative earth vehicles only. For safety, disconnect car battery before fitting the unit.
- The relay should be fitted in a dry ventilated space, in a position providing protection from physical damage and close to the 12S socket.(usually in the boot of the vehicle)
- Route the Black 3.0 $mm^2$ single cable from car battery or fuse box to boot, fitting an in line fuse holder with 2 x Yellow insulated terminals and 25 amp fuse, but removing the fuse at this stage.
- Offer up the relay to the various wires and make secure connections through the terminal block according to the chart below.

| Relay Terminal | Connection |
|---|---|
| 12v | Black 3.0$mm^2$ cable from car battery with 25 amp fuse |
| 12v | Not used |
| 6 | Grey wire from Socket Pin 10 - (Switched Supply) |
| 4 | Orange wire from Socket Pin 9 - (Constant Supply) |
| 2 | Linked to Grey wire from Relay Terminal 6 to Socket Pin 10 - (Switched Supply) |
| 0v | Suitable good earth: 50cm White wire and Blue ring terminal provided, preferably to chassis. |




- Secure the relay to the harness or similar preferably using a cable tie, such that there is adequate ventilation to allow dissipation of heat from the unit.
- Insert the in line fuse and test.
  With the engine off, the unit should remain un-switched.
  With the engine on, the unit should turn on after a suitable delay of approx. ½ minute.
  If a load simulation is available, test to ensure unit stays on under load.

Troubleshooting

| | |
|---|---|
| Relay will not turn on with engine running | Insufficient voltage caused by faulty battery or alternator |
| Relay cycles under load | Faulty car battery<br>Faulty electrical connections<br>Excessive length or insufficient gauge of supply leads<br>Single supply lead only used instead of double<br>Excessive load – Discharged Leisure Battery or short |
| Long delay before turning off | Battery maintaining voltage. Normal with new battery |

In case of difficulty in fitting this product, advice can be obtained by consulting an auto electrician or phoning **0121-270-4301** 07/20