

Measuring the brake light circuit

As an example for this task, the brake light circuit of the Alfa Romeo Montreal is shown in figure 1. For more details consult the complete diagram. The circuit is powered by the alternator/battery through a fuse.

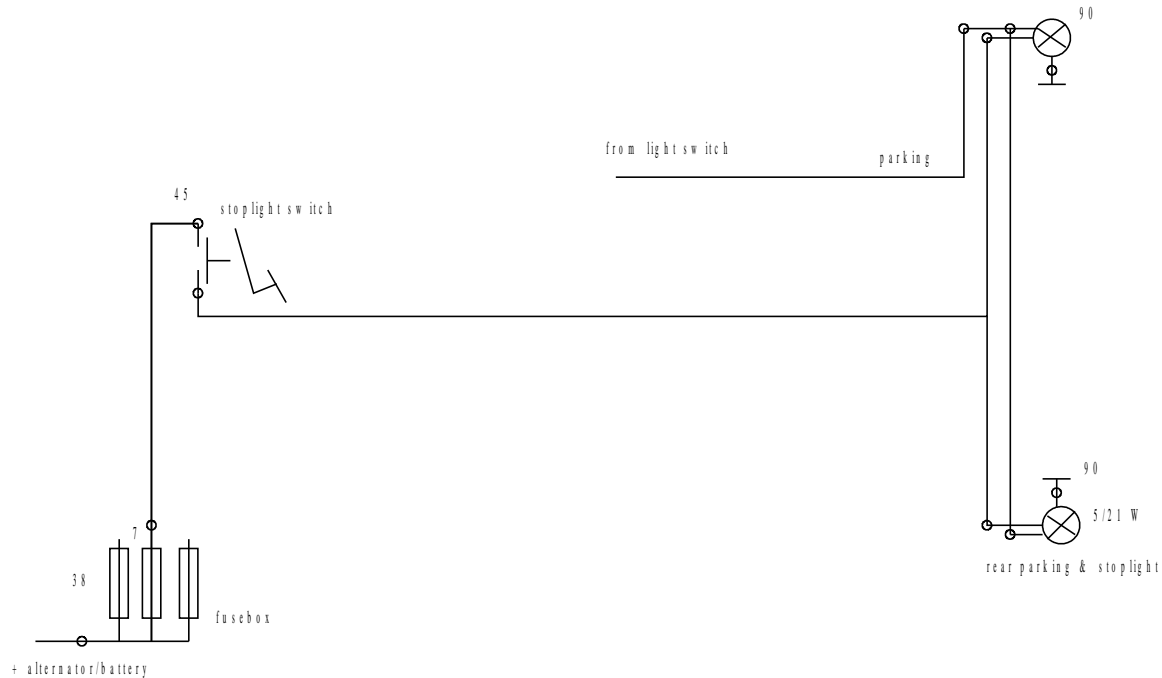


Fig. 1 Partial diagram of the brake light circuit

Assignment

1. Using your demonstration car, check to see how the brake lights are connected. Use the demonstration car's electrical diagram for this. Locate the various components.
2. Draw your own partial diagram of this brake light circuit and mark the measurement points for the tasks.
3. If desired, add simple malfunctions to the circuit on the car such as:
 - broken wire
 - poor ground connection
 - burnt-out fuse or wrong amp fuse
 - extra resistance at the switch
 - light bulb too weak or too strong (24 V instead of 12 V)
 - short circuit to the brake light

Make sure that the measurement points are accessible for the students.

As an example, figure 2 shows a number of measurement points in the circuit along with several measurement tasks.

In this case, the negative probe on the multimeter must be connected to the negative pole

of the battery.

It is also possible to measure across the brake light switch. This is then a so-called voltage difference measurement.

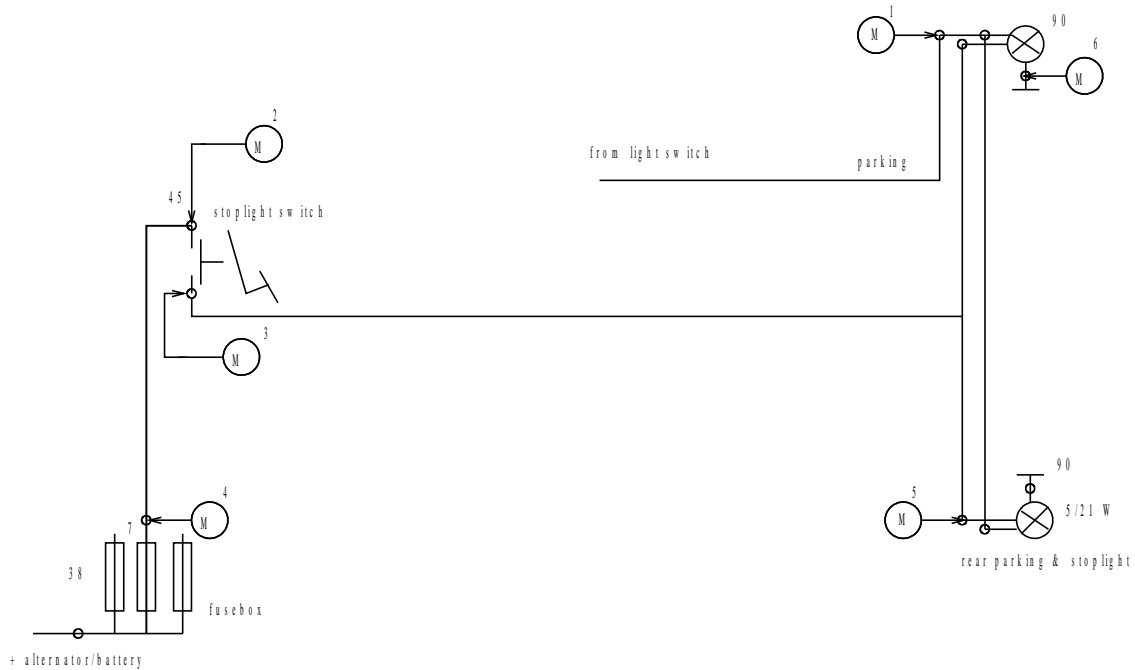


Fig. 2 Brake light diagram with possible measurement points.

Measurement tasks

Fill in the chart with voltmeter readings in the following situations:

- situation 1: brake pedal not depressed
- situation 2: brake pedal depressed

	M1	M2	M3	M4	M5	M6
situation 1						
situation 2						

situation 3:
 Connect the voltmeter across M2 and M3 (ΔV)
 You measure:.....V

Conclusions:
 The measured values in situation 1 are: normal / abnormal
 If they are abnormal, give a possible cause.

The measured values in situation 2 are: normal / abnormal
 If they are abnormal, give a possible cause.

The measured value in situation 3 is: normal / abnormal
 If it is abnormal, give a possible cause.