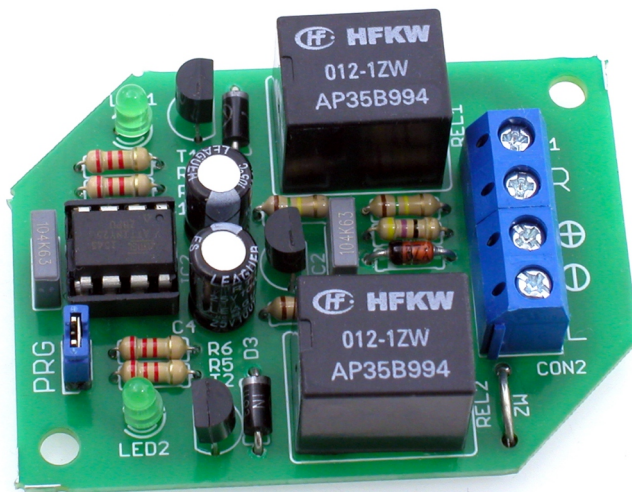




AVT 1945



ASSEMBLY DIFFICULTY



The function of the Comfort Direction Light Indicator Module is that when the indicator is activated even for a fraction of a second, the corresponding side light blinks three times. If you switch on an indicator for one 'blink', the controller will complete the operation of the selected indicator to the full three blinks. In newer cars this is a standard feature, in older cars you can add such functionality by attaching the described module.

Specifications

- supply voltage 9-18V
- low power consumption - less than 1 mA in standby mode
- easy to install in the vehicle
- dedicated Z68U housing
- board size: 58×42 mm

Circuit description

A device fitted to the car's installation causes three flashes to be generated on the turn signals of one direction after one flash occurs on those signals. The first flash of the turn signals, the one that triggers the whole process, is performed by the car driver. It does not have to be a full blink, a min. 0.2s pulse is sufficient. The device will complete this blink to a full cycle and then perform another two blinks. In addition to the its basic function, the device also provides for responses to special situations. If there is an additional impulse during the three-flash cycle, i.e. the turn signals are activated by the driver, not from the module, then the cycle is interrupted. In practice, the idea is that the first

short 'pulse' starts a cycle of three flashes and the next pulse during the cycle, in the same direction, interrupts the process. The second special situation occurs when, during a cycle of three flashes, there is a pulse on the indicators on the opposite side - the driver has changed the direction of the manoeuvre. Then, the current cycle is interrupted as well and, at the same time, the cycle on the opposite side begins. The last special situation is when the turn signals flash for both directions. Any ongoing cycle is then interrupted and no further action is taken. Therefore, flashing the hazard lights at the "thank you" sign or locking the car with the remote control will not activate this device.

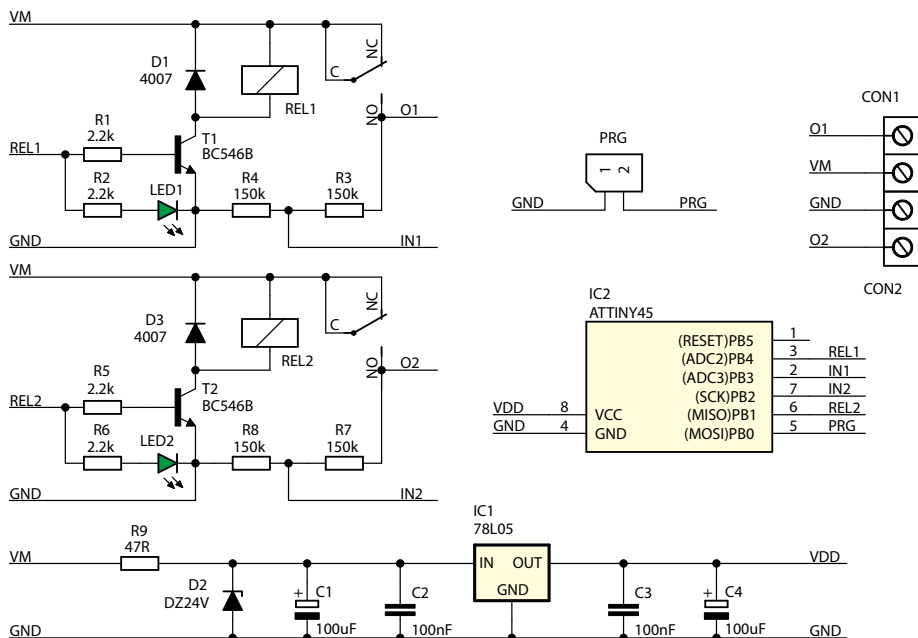


Fig. 1 Schematic diagram

Structure and mounting

A schematic of the circuit is shown in Figure 1. The schematic is not complicated, you can see the power block with stabiliser IC1, the twin executive blocks with relays REL1 and REL2 and the control block with microcontroller IC2. The most important block of the device cannot be seen on the diagram - it is the control program, contained in microcontroller memory. Due to its simple design, the assembly of the module is also not complicated and requires basic soldering experience. Much more attention and

work is required to place the circuit in the housing, installing the module in the car, routing out the connections and protecting the module and connections against shocks, moisture and other harsh conditions. To ensure trouble-free operation of the device, each operation must be carried out reliably. However, before installing the module permanently, it is recommended to check that it is functioning correctly by connecting it using the "short" method.

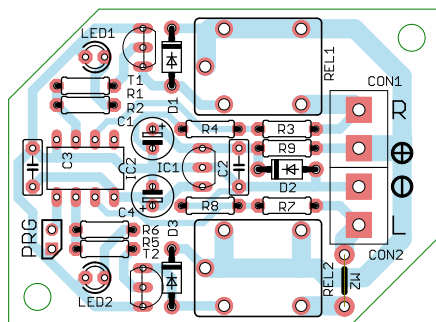


Fig. 2 Arrangement of components on the PCB

The module requires only the power supply and the left and right indicator circuits to be connected, making it relatively easy to connect to the car's installation. The CON1 and CON2 connector signals are described in detail on the board. Power supply to the module may be connected from any circuit in which voltage appears "after the ignition switch". The circuit will probably be fused, so it may be necessary to replace the fuse with one with a higher current rating, as the power supply to the indicator lights, during the operation of the module, will be drawn from this circuit.

Connection to the turn signals can easily be realised, e.g. at the headlight connectors (even rear lights). It is important to connect to the 'plus' signals of both sides. It is worth mentioning that the module itself has negligible power consumption. Due to the use of a power-saving stabiliser and the fact that the control programme shuts down unused microcontroller components and starts sleep mode when possible, the current drawn is less than 1mA.

Configuration

The flashing cycle times of the turn signals are similar in all vehicles, but are not identical. The module, from the outset, has default flashing cycle times set, and to match the module to the flashing cycle of the target car, a simple configuration must be carried out. After connecting to the car's installation and powering up the module, put a jumper on the pins labelled PRG. Then, permanently switch on one left or right

indicator (but not both - not the hazard warning lights). During this time, the device measures the parameters of the flashing cycle and stores them. After 4...5 flashes the procedure will be finished and the device will signal this with a long blink of both indicators. You can then switch off the attached indicator and remove the jumper from the PRG pins, now the unit is ready for operation.

List of elements

Resistors:

- R1, R2, R5, R6:.....2,2 kΩ
- R3, R4, R7, R8:.....150 kΩ
- R9:.....47 Ω

Capacitors:

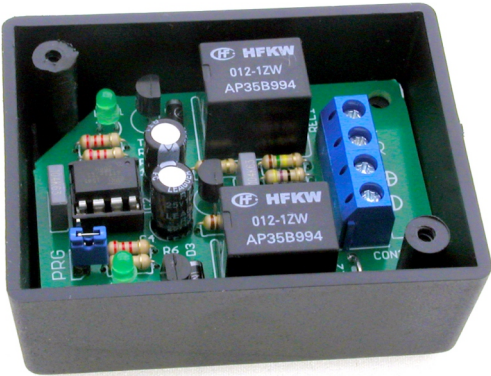
- C1, C4:100 µF / 25 V
- C2, C3:100 nF

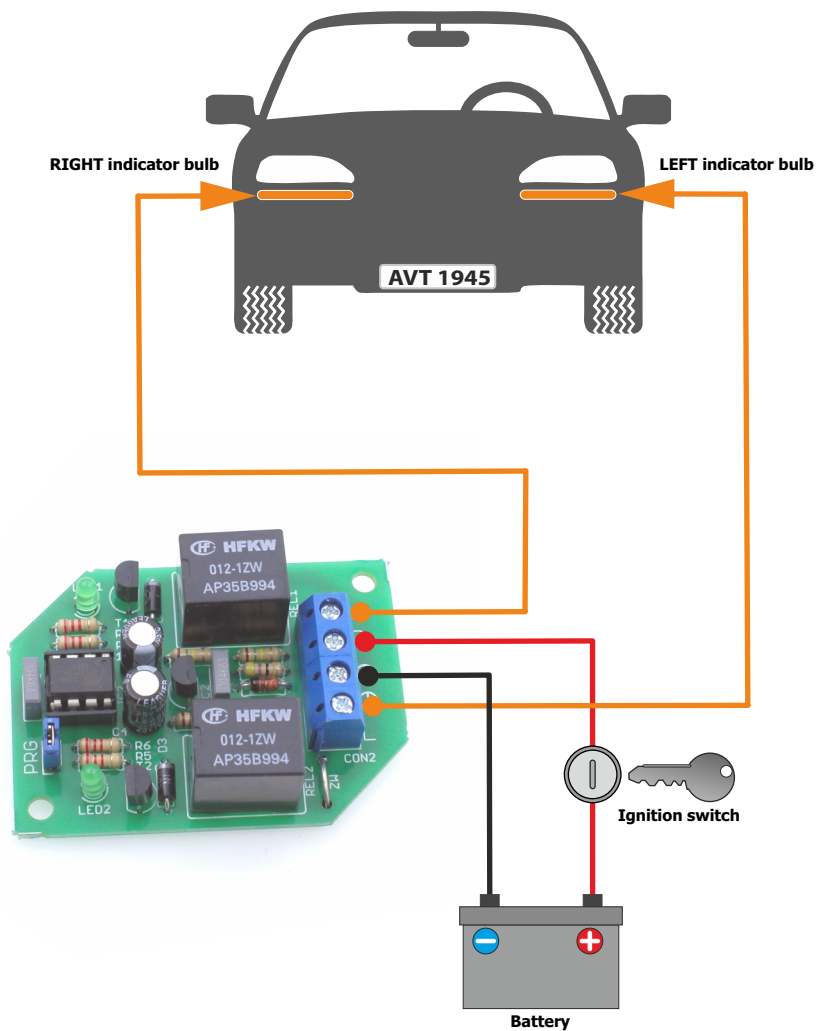
Semiconductors:

- D1, D3:.....1N4007 or similar
- D2:Zener diode 24V
- LED1, LED2:.....LED φ 3mm
- T1, T2:.....BC547
- IC1:.....LM2931-5V
- IC2:.....ATTINY25

Other:

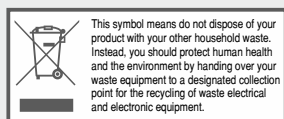
- REL1, REL2:.....HFKW012
- PRG:.....goldpins + jumper
- ZW:wire jumper
- CON1, CON2:.....ARK2/500
- Z68U housing





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