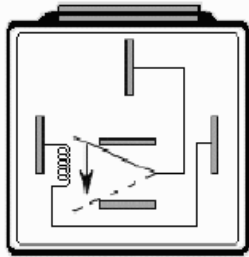




Terminals



Internals

Understanding how a relay works is the first step towards being able to wire many different relay applications. For the purpose of this text, please refer to the above diagram as we attempt to explain how a relay operates.

First you must understand the components that make up a relay. The standard relay used in automotive accessories is the Bosch style 30 Amp. Single Pole, Double Throw (SPDT) type. This type of relay has five terminals at its base. Each terminal is numbered and serves a unique purpose

Terminals or pins as they sometime referred to, are connected to either +12 Volts or Ground. Depending on which terminals are connected to what a relay can be configured to operate many different devices such as a trunk release solenoid, power door locks, dome light circuit or just about anything you can think of.

Terminals 85 & 86 are the two pins that drive the relay's coil. The coil is what is used to "energize" a relay.

When one of the pins is connected to +12 Volts and the other to ground, the relay is said to be energized or switched on.

Terminal 30 is the Common terminal or pin. That is to say that it is common to both terminals 87 & 87a. No matter what state the relay is in (either energized or not), pin 30 will have continuity to either pin 87 or 87a. This is normally used as the output of the relay.

Terminal 87 is referred to as the Normally Open pin. This means that when the relay is not energized, this terminal has no continuity with any of the relay's other terminals. When the relay is energized, pins 30 and 87 have continuity, only.

Terminal 87a is referred to as the Normally Closed pin. This terminal has continuity with pin 30 only when the relay is not energized. When the relay is energized this pin has no continuity with any of the relay's other terminals.

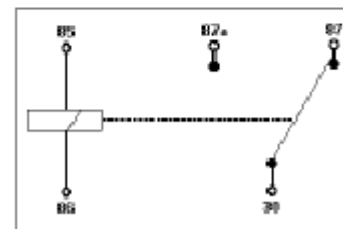
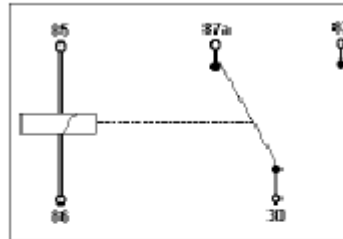
Overview

Relays are widely used in electrical applications where one circuit is to be energized or turned "on" by the presence of a voltage, provided by another circuit. An example of this is when an automotive radio sends out a triggering voltage to turn on an external amplifier or activate a motorized antenna. Anywhere a switch can go in a circuit, a relay can replace it, (as long as there is a triggering voltage available to activate it).

The "switch" in a relay is more often called a solenoid. A solenoids is like a piston that pushes outward when energized with electricity. This push mechanically trips the switch in the relay, completing circuit and allowing the switched voltage output.

A relay can be triggered with an electrical pulse as small as 150 milliamps. The switched output can be as high as 30 or 40 amps.

Relay at rest



Relay energized

Connections

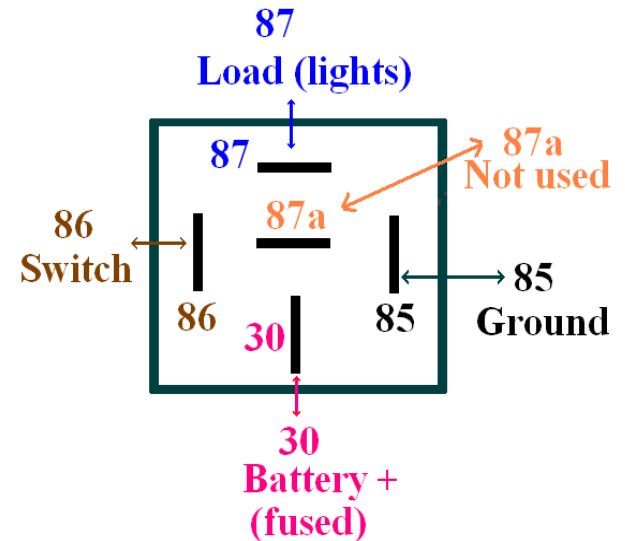
The terminals of a relay are defined as follows:

- 30** is the common or input voltage (or ground) to be switched.
- 87a** is the normally closed connection (can be used as a switched voltage output when the relay is at rest). (This terminal offers no voltage when the relay is energized.)
- 87** is the normally open connection (switched voltage output when the relay is energized).
- 85** is connected to the ground of the triggering voltage.
- 86** is connected to the positive 12V of the triggering voltage.

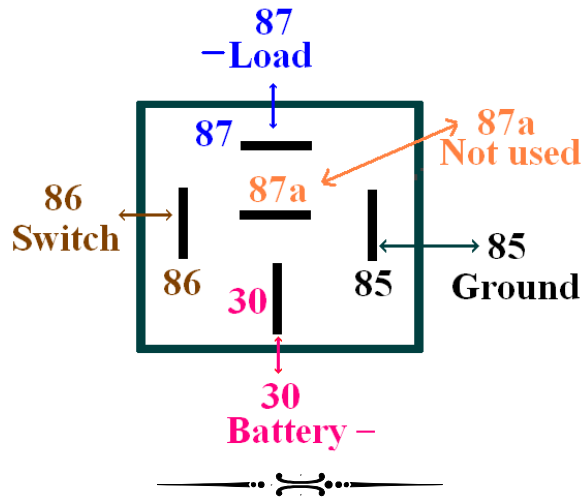
Note: in many cases, the connection of pins 85 and 86 can be interchangeable, but NOT if there is a diode wired across the coil.

Adding + 12volts

(most common use)

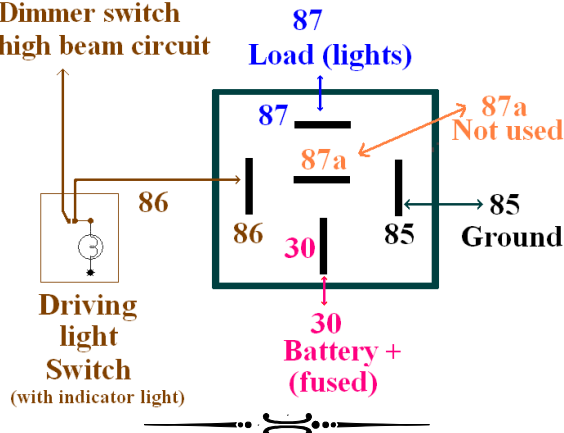


Adding -12 volts when required



Driving Light circuit

Power from
Dimmer switch
high beam circuit



Auxiliary driving lamps on a motor vehicle must be used **only** at the same time the high beams on the headlamp are used .

Fog lamps on a motor vehicle must be used **only** at the same time the low beams on the head lamps are used. (fog lamps may be used without head lamps if the weather and road conditions make the use of head lamps disadvantageous.)

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The Common Relay

