# KNOW YOUR RELAY

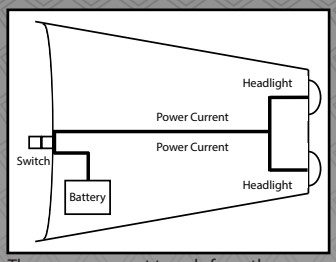
## Get to Know Relays

### What is a Relay?

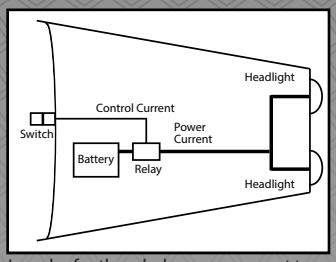
A relay is a remote-control switch in which an electro-magnetically produced force operates the contacts through which the main power current flows.

### Why use a Relay?

Relays provide benefits such as, weight, space and cost savings due to the use of thinner cables which are used to connect the control switch to the relay. Relays allow reduction of voltage loss as power can be routed to a device over short distances. High current circuits can be controlled by low current circuits through the use of relays. There are multiple benefits of using relays in cars. Many circuits in a car can be perfectly controlled by relays, such as headlights, electric motors, heater etc. Relays can be positioned anywhere in the vehicle to provide efficient power transfer to the electrical accessory being controlled.



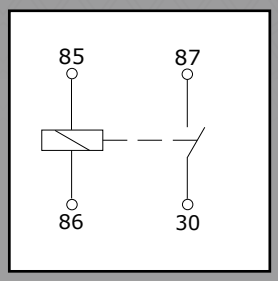

The power current travels from the battery to headlights using a large gauge cable via the switch. This will result in a voltage drop causing a reduction in the performance of the headlights and possible overloading of the switch.

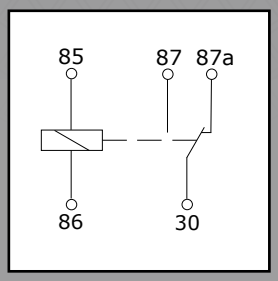



In order for the whole power current to reach the consuming device, the best solution is to route the power current using the shortest distance between the battery and headlamp via a relay.

### What is the difference between Form A or Form C relays?

The difference between a Form A and a Form C relay is that a Form A relay is used to control a single circuit, whereas a Form C relay switches power between two circuits.




### Form A or Normally Open

Also known as normally open relay or SPST.
Normally open relays close the circuit when the coil is activated allowing the power current to flow. Pins 85 and 86 are used to control the coil and pins 30 and 87 are used for switching power on a single circuit. They are used in air-conditionning equipment, fan motors and in all types of vehicle lighting, horns and heating circuits.

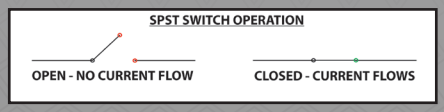
### Form C or Change-Over

Also known as change-over relay or SPDT or DPST.
Upon activating the coil, power is switched from one user to another. Pins 85 and 86 are used to control the coil and pins 30, 87 and 87A are used for switching power between two circuits. They are used for fans, window heating systems and for switching between opening and closing sliding rooves and opening and closing windows.

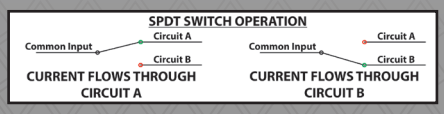
### Abbreviations

**SPST**: Single Pull Single Throw
**SPDT**: Single Pull Double Throw
**DPST**: Double Pull Single Throw

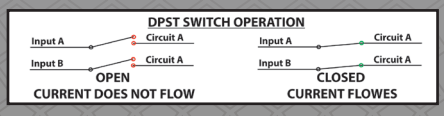
**SPST:** Switches consist of a single input and a single output, NO/NC (Normally Open/Normally Closed). Ideal for ON-OFF applications. SPST switches offer a simple design and are easily set up as they require less cabling.




**SPDT:** Switches consit of one common input and two outputs. Used in ON-ON and ON-OFF-ON applications. SPDT switches are one of the most common styles of switch. They allow the current to easily be switched between two outputs.




**DPST:** Switches consist of two inputs and two outputs which are managed using a single actuator (toggle, push button etc.) DPST switches are essentially two SPST switches working in tandem, affecting seperate circuits controlled by one actuator.




### Removing voltage spikes: *Relays with resistors and diodes between terminals 85 and 86.*

When a relay is switched off, voltage spikes from 300V to 500V can occur momentarily. If the spikes reach the vehicle electrical network without suppression, malfunctions can occur or sensitive electronic equipment can be damaged. Relays with a diode will eliminate the spikes completely. Relays with a resistor reduce the voltage spikes to less than 100V.

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## Weather Resistant Relays

### SPDT 40/30A 12V DC

**Five terminals with resistor for voltage spike protection.
Plastic body with a detached metal mounting bracket.
Combine with Pico No. 5564 or 5565 relay pigtail, to seal against moisture, dirt and dust.**


| Description | PICO |
|---|---|
| 40/30A 12V DC with resistor | 927-11 |

### SPDT 30/20A 24V DC

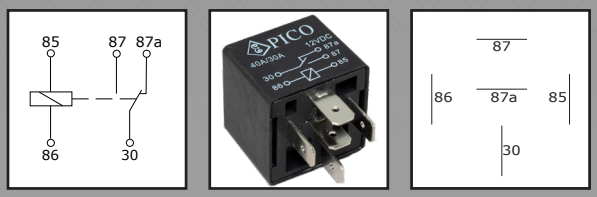
**Five terminals with resistor for voltage spike protection.
Plastic body with a detached metal mounting bracket.
Combine with Pico No. 5564 or 5565 relay pigtail, to seal against moisture, dirt and dust.**


| Description | PICO |
|---|---|
| 30/20A 24V DC with resistor | 929-11 |

## Mini Relays

### SPDT 40/30A 12V

**Five terminals without resistor/diode for voltage spike protection. Plastic body without a mounting bracket. Use with 5563, 5653, 5663 pigtails or 9901, 9902 sockets.**




| Description | PICO |
|---|---|
| 40/30A 12V DC | 907-11 |

### SPDT 40/30A 12V

**Five terminals with diode for voltage spike protection. Plastic body without a mounting bracket. Use with 5563, 5653, 5663 pigtails or 9901, 9902 sockets.**


| Description | PICO |
|---|---|
| 40/30A 12V DC with diode | 917-11 |

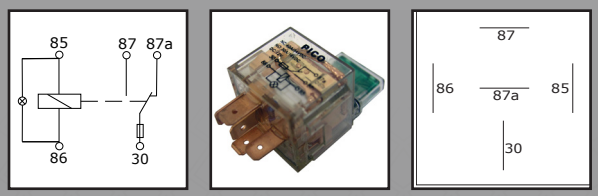
### DPST 40/30A 12V

**Five terminals with diode for voltage spike protection. Plastic body without a mounting bracket. Use with 5563, 5653, 5663, pigtails or 9901, 9902 sockets.**


| Description | PICO |
|---|---|
| 40/30A 12V DC with diode | 918-11 |

### SPDT 40/30A 12V

**Comes with a built-in 30A fuse. Five terminals with resistor for voltage spike protection. Plastic body with an attached plastic mounting bracket. Use with 5563, 5653, 5663 pigtails or 9901 sockets.**




| Description | PICO |
|---|---|
| 40/30A 12V DC with resistor | 919-11 |

### SPDT 40/30A 24V DC

**Five terminals with resistor for voltage spike protection.
Plastic body with an attached plastic mounting bracket. Use with 5563, 5653, 5663 pigtails or 9901, 9902 scokets.**


| Description | PICO |
|---|---|
| 40/30A 24V DC with resistor | 923-11 |

### SPDT 40/30A 12V

**Five terminals with resistor for voltage spike protection.
Plastic body with an attached plastic mounting bracket. Use with 5563, 5653, 5663 pigtails or 9901, 9902 sockets.**


| Description | PICO |
|---|---|
| 40/30A 12V DC with resistor | 925-11 |

# KNOW YOUR RELAY

## Mini Relays

### SPDT 40/30A 12V
**Five terminals with resistor for voltage spike protection. Plastic body without a mounting bracket. Use with 5563, 5653, 5663 pigtails or 9901, 9902 sockets.**


| Description | PICO |
|---|---|
| 40/30A 12V DC with resistor | 931-11 |

### SPDT 40/30A 12V
**Five terminals without resistor/ diode for voltage spike protection. Plastic body with an attached plastic mounting bracket. Use with 5563, 5653, 5663 pigtails or 9901, 9902 sockets.**


| Description | PICO |
|---|---|
| 40/30A 12V DC | 932-11 |

### SPST 40/30A 12V
**Five terminals without resistor/diode for voltage spike protection. Plastic body with a detached metal mounting bracket.**

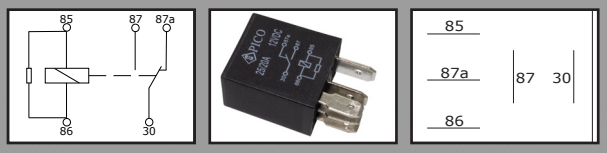

| Description | PICO |
|---|---|
| 40/30A 12V DC | 933-11 |

### DPST 40/30A 12V
**Five terminals without resistor/diode for voltage spike protection. Plastic body with an attached plastic mounting bracket. Use with 5563, 5653, 5663 pigtails or 9901, 9902 sockets.**


| Description | PICO |
|---|---|
| 40/30A 12V DC | 934-11 |

## Micro Relays

### SPDT 25/20A 12V
**Five terminals with resistor for voltage spike protection. Plastic body without a mounting bracket. Use with 5567 pigtail.**




| Description | PICO |
|---|---|
| 25/20A 12V with resistor | 911-11 |

### SPST 40/30A 12V DC
**Five terminals with resistor for voltage spike protection. Plastic body without a mounting bracket. Use with 5567 pigtail or 9903 socket.**


| Description | PICO |
|---|---|
| 40/30A 12V DC with resistor | 913-11 |

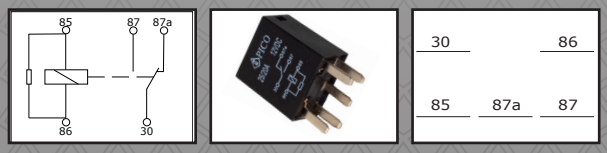
## Large Blade Relays

### SPDT 80/60A 12V
**Five terminals without resistor/ diode for voltage spike protection. Plastic body with an attached metal mounting bracket. Use with 5566 pigtail.**


| Description | PICO |
|---|---|
| 80/60A 12V DC | 921-11 |

## ISO Relays

### SPDT 25/20A 12V
**Five terminals with resistor for voltage spike protection. Plastic body without a mounting bracket.**




| Description | PICO |
|---|---|
| 25/20A 12V DC with resistor | 915-11 |

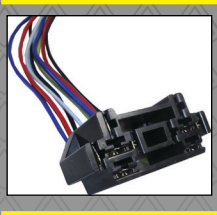
# KNOW YOUR RELAY

## Relay Pigtails

| 1 PC | 25 PCS |
|---|---|
| 5563-11 | 5563-35 |

### 10-Pin Dual Relay Pigtail

8-Wire Lead. Combine with Mini Relays.



| Coil | | Wire | Gauge |
|---|---|---|---|
| 85 | Ground | Black | 18 AWG |
| 86 | +12V | White | 18 AWG |
| **Contacts** | | **Wire** | **Gauge** |
| 30 | Common | Blue | 14 AWG |
| 87 | Normally Open (NO) | Yellow | 14 AWG |
| 87a | Normally Closed (NC) | Red | 14 AWG |

| 1 PC | 25 PCS |
|---|---|
| 5565-11 | 5565-35 |

### 4-Pin Weather Resistant Relay Pigtail

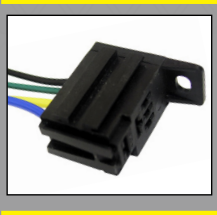
4-Wire Lead. Combine with Weather Resistant Relay to seal against moisture, dirt and dust.

| Coil | | Wire | Gauge |
|---|---|---|---|
| 85 | Ground | Black | 18 AWG |
| 86 | +12V | White | 18 AWG |
| **Contacts** | | **Wire** | **Gauge** |
| 30 | Common | Blue | 18 AWG |
| 87 | Normally Open (NO) | Red | 18 AWG |

| 1 PC | 25 PCS |
|---|---|
| 5567-11 | 5567-35 |

### 5-Pin Relay Pigtail

Can be used with Micro Relays.

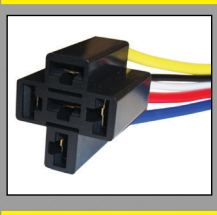


| Coil | | Wire | Gauge |
|---|---|---|---|
| 85 | Ground | Red | 14 AWG |
| 86 | +12V | White | 14 AWG |
| **Contacts** | | **Wire** | **Gauge** |
| 30 | Common | Brown | 18 AWG |
| 87 | Normally Open (NO) | Yellow | 18 AWG |
| 87a | Normally Closed (NC) | Red | 18 AWG |

| 1 PC | 25 PCS |
|---|---|
| 5663-11 | 5663-35 |

### 5-Pin Relay Pigtail

5-Wire Lead. Combine with Mini Blade Relays.

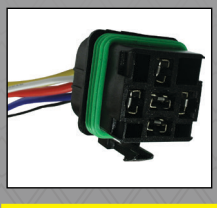


| Coil | | Wire | Gauge |
|---|---|---|---|
| 85 | Ground | Black | 18 AWG |
| 86 | +12V | White | 18 AWG |
| **Contacts** | | **Wire** | **Gauge** |
| 30 | Common | Blue | 16 AWG |
| 87 | Normally Open (NO) | Yellow | 16 AWG |
| 87a | Normally Closed (NC) | Red | 16 AWG |

| 1 PC | 25 PCS |
|---|---|
| 5564-11 | 5564-35 |

### 5-Pin Weather Resistant Relay Pigtail

5-Wire Lead. Combine with Weather Resistant Relay to seal against moisture, dirt and dust.

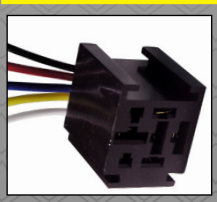


| Coil | | Wire | Gauge |
|---|---|---|---|
| 85 | Ground | Black | 18 AWG |
| 86 | +12V | White | 18 AWG |
| **Contacts** | | **Wire** | **Gauge** |
| 30 | Common | Blue | 14 AWG |
| 87 | Normally Open (NO) | Yellow | 14 AWG |
| 87a | Normally Closed (NC) | Red | 14 AWG |

| 1 PC | 25 PCS |
|---|---|
| 5566-11 | 5566-35 |

### 5-Pin Large Blade Relay Pigtail

5-Wire Lead. Can be used with Large Blade Relay.

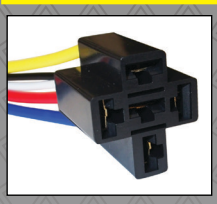


| Coil | | Wire | Gauge |
|---|---|---|---|
| 85 | Ground | Black | 18 AWG |
| 86 | +12V | White | 18 AWG |
| **Contacts** | | **Wire** | **Gauge** |
| 30 | Common | Blue | 12 AWG |
| 87 | Normally Open (NO) | Yellow | 12 AWG |
| 87a | Normally Closed (NC) | Red | 12 AWG |

| 1 PC | 25 PCS |
|---|---|
| 5653-BP | 5653-35 |

### 5-Pin Relay Pigtail

5-Wire Lead. Combine with Mini Blade Relays.



| Coil | | Wire | Gauge |
|---|---|---|---|
| 85 | Ground | Black | 18 AWG |
| 86 | +12V | White | 18 AWG |
| **Contacts** | | **Wire** | **Gauge** |
| 30 | Common | Blue | 14 AWG |
| 87 | Normally Open (NO) | Yellow | 14 AWG |
| 87a | Normally Closed (NC) | Red | 14 AWG |

### 5-Pin Relay Socket & Terminals

Can be used with Mini Blade Relays. Multiple units stack together.

| 1 PC | 25 PCS |
|---|---|
| 9901-11 | 9901-35 |

### 5-Pin Relay Socket & Terminals

Can be used with Mini Blade Relays.

| 1 PC | 25 PCS |
|---|---|
| 9902-11 | 9902-35 |

### Micro Relay Socket W/Terminals

Can be used with Micro Relays. Multiple units stack together.

| 1 PC | 25 PCS |
|---|---|
| 9903-11 | 9903-35 |