Trailer Wiring Options

By law trailers are required to have at least running lights, turn signals, and brake lights. To provide the power and a connection for these functions, the tow vehicle's electrical system needs to be tapped into. There are two options available for connecting to your vehicle's electrical system, a plug in style T-One connector or a custom selected hardwire kit.

Custom Wiring Fitguide
Please select the year of your vehicle to search for a custom fit wiring harness

Select Year Go

T-One Connector

The easiest way to make this connection is with the use of a T-One Connector, which comes with OEM style connections that simply plug into your vehicle's existing wiring harness, typically near the rear of the vehicle or by the tail lights. Sometimes the vehicle manufacturer will run the wires to an easily accessible plug underneath the vehicle or behind the paneling in the back cargo area. T-Ones come pre-wired with a 4-way flat trailer connection and can be expanded to 5-way, 6-way, or 7-way trailer connections through the use of a wiring adapter.

Custom Hardwire Kit

If a T-One is not available, a connection can still be easily made by using one of our custom selected hardwiring kits. We offer kits with all the pieces you will need to simply tap into the existing wires on your vehicle. This may sound difficult, but scotch

locks make installing the wiring harness quick and easy. A scotch lock has two grooves in it, one groove is for the vehicle wire, and the other groove is for the wire on hardwire kit. Once both wires are in the grooves, you simply press down on

the top of the scotch lock. This forces a metal piece into both wires, connecting the circuit and eliminating any need for cutting or splicing. To hardwire the tow vehicle for a trailer connector you need to locate the proper wires. To help in this task you can check the vehicle's owner manual or use a circuit tester. The circuit tester is used to make sure the correct wires on the hardwire kit are connected to the matching wires on the vehicle, it helps determine which wire performs which function. The easiest place to tap into the vehicle's wiring system is behind the tail lights. By turning on the left turn signal, a circuit tester can be used to test the different wires behind the driver's side tail light. When the circuit tester lights up, you know that wire carries the left turn function. A scotch lock slid through the yellow wire on the trailer connector and around the just found vehicle wire will clamp down to provide a secure connection.

The three types of Hardwire Kits are:

Standard 4-Pole Wiring Harness - For use with vehicles that have adequate power and standard wiring system, these simply connect into existing wires on the vehicle and have a 4-pole flat connector to attach a trailer.

Converter - For use with vehicles that have separate turn and brake light wires. Some vehicles send only one signal per wire, creating what is called a 3-wire system: one wire for the left turn, one wire for the right turn, and one wire for the brake signal (common on vehicles with amber turn signals). A converter will reduce it to a standard 2-wire system needed for wiring a trailer. There are still additional wires for the running lights and for the ground. Any vehicle with amber turn signals will need a converter. However, there are some vehicles with all-red tail lights that can also require a converter. A wiring harness with a converter has a black box built in it. Five wires go into the box, and only 4 come out. The converter transfers the brake signal on the vehicle into the left and right turn signals for the trailer wiring system.

Modulite or Powered Converter - Used with vehicles that do not provide enough electrical power to handle the additional strain of powering trailer lights, the Modulite or powered system draws power directly from the battery but still connects to the vehicles wiring system to determine when to power the lights on the trailer. If there are too many lights on the trailer for the vehicles electrical system to provide adequate power, use a modulite or powered converter. A modulite installs the same way as a standard converter except an extra wire must be run to the battery. Instead of drawing power from the vehicle wiring system, a modulite draws power directly from the vehicle battery. This is safer because the extra amps to power the trailer are no longer going through the expensive electrical components of the vehicle. More vehicles are using thinner gauge wire and require a modulite, regardless of how many lights are on the trailer, simply to protect their wiring system.

Wiring Adapter Fitguide

Need help to **find the correct wiring adapter** for your car, truck, or trailer?

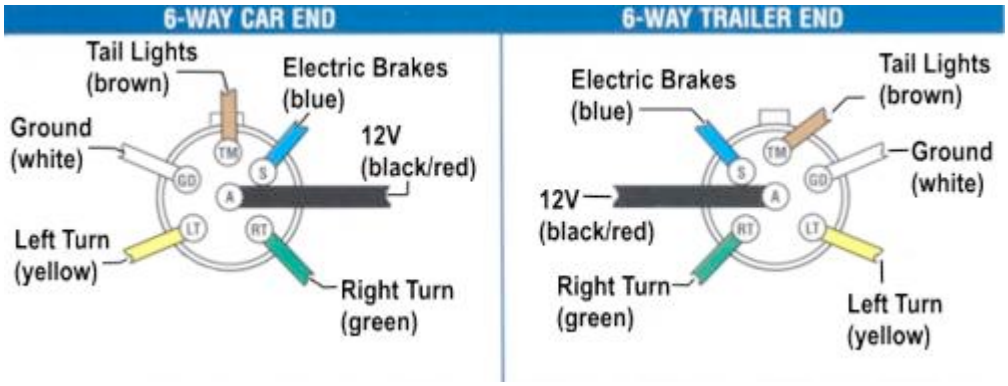
Use the Hitch Hunter™ Wiring Adapter Fitguide to easily find the adapter you need.

Trailer Wiring Adapters

The T-One connectors and hardwire kits all use a 4-pole trailer connector. This connector is most common among the smaller utility trailers and can easily be adapted to match the larger 5-pole, 6-pole and 7-pole styles. Using an adapter lets you avoid having to splice into the vehicle's wiring system. Adapters will plug into the flat 4-pole connector and have wire leads to provide additional functions such as powering trailer brakes, power lead for utility lights, reverse, or auxiliary power for a winch or tools. If your vehicle or trailer is equipped with something other than a 4-way plug, such as the larger 7-way round plug, you can use our adapter fitguide to find the one that is right for your vehicle and trailer.

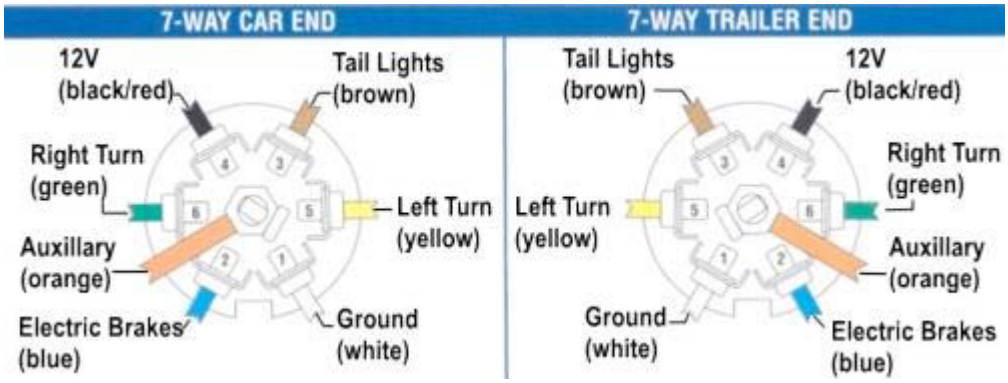
Trailer Wiring Diagrams

6-Way Trailer Wiring Diagram



*Sometimes the 12V and electric brake wire is switched

7-Way Trailer Wiring Diagram



Trailer Wiring Color Code

Connector				Function	Color	Suggested Minimum Wire Gauge		Where To Attach - Vehicle Side	Where To Attach - Trailer Side
						4 Way & 5 Way	6 Way & 7 Way		
7 Way	6 Way	5 Way	4 Way	Right Turn	Green	18	16	Right turn of vehicle's wiring harness	Trailer's right turn signal
				Left Turn	Yellow	18	16	Left turn of vehicle's	Trailer's left turn signal

					wiring harness	
	Ground	White	16	12	Vehicle ground point - metal, uncoated, rustproof	Vehicle ground point - metal, uncoated, rustproof
	Tail / Marker	Brown	18	16	Taillight of vehicle's wiring harness	Trailer's taillights
	Brake	Blue	18	12	Electric brake control, power for brakes	Break away switch
	Battery	Red (or Black)		12	Fuse block or FUSED battery Lead	Break away kit, interior lights and battery charger.
	Back Up	Purple		16	Back up of vehicle's wiring harness	Back up lights (if available) / Hydraulic coupler.

This chart is a typical guide, wire colors may vary based on manufacturers. Use a circuit tester to verify connections.

Troubleshoot Your Trailer Wiring

If you have a Modulite (powered converter), Converter, or T-One connector that is not working properly, you need to use a circuit tester to determine the source of the problem.

- Check to make sure there is a signal going into and coming out of the converter or Modulite box without the trailer hooked up. The only part of the wiring harness that will typically go bad is the box, so you need to determine if a signal is making it to the box, and if so, is it coming back out on the correct wires. There are four possibilities:

    1. There is **no signal going into the box**, meaning something is incorrect on the vehicle.
        - **Solve the problem** by checking for blown fuses and then check the installation points. Use a circuit tester to check that the correct

wires are tapped into, the wiring harness connectors are plugged into the correct vehicle connectors, and check that connectors are plugged in all the way.

2. A **signal is going in and coming out on the appropriate wires**, then there is a problem with the trailer wiring.
    - **Solve the problem** by inspecting the wiring on the trailer to make sure all of the connections are correct and ground wires are connected properly. Most likely, the ground wire on the trailer is not secured properly. A trailer wiring system is grounded to the frame near the coupler and each light also needs to be grounded. If there is not a white ground wire coming out of a trailer light, then the light is grounded through its mounting studs. Too much paint, dirt, or rust can cause bad grounds, so make sure the ground is secured to the bare metal frame. Also look for pinched or cut wires, these are ofted found when wires are routed above suspension components or behind taillights
3. If a **signal is going into the box and not coming out** or **a signal is going into the box and coming out on the wrong wires** the ground on the vehicle may not be connected properly. If the white ground wire is not installed properly on the vehicle, then the green and yellow wires will not carry signal coming out of the box.
    - **Solve the problem** by checking to make sure the ground wire is installed properly on the vehicle. To make sure you have a suitable ground, first connect the circuit tester's ground wire to the same location as the ground wire on the wiring harness. Then test the signal going into the converter or modulite box. If there is no signal, connect the circuit tester to another grounding location such as the exhaust pipe. If a signal is present, the grounding location for the wiring harness is bad, and a new location needs to be found. On a few vehicles, the frame and body components are not grounded. In these rare instances, look for a ground wire coming out of the license plate light.
4. Due to extensive testing and quality control, it is very rare that a new wiring harness will be defective. If the wiring harness worked properly when installed but then went bad, there is a strong possibility that it has **shorted out** because of a problem with the trailer wiring. Make sure to correct any trailer wiring problems before installing a new wiring harness.

Converter Shorting Out

When too many amps are drawn through the converter box, it can be shorted out. The possible causes are:

- **Too many lights on the trailer.** Each incandescent taillight draws about 2 amps and side marker lights typically draw about 0.5 amps each. Most converters allow

up to 4 amps to pass through them. A standard converter cannot have any more than 1 taillight on each side.
    - To **solve the problem** of too many lights on the trailer, use a modulite or powered converter. It installs the same way as a standard converter except an extra wire is run to the battery so the modulite draws power directly from the vehicle battery. The modulite comes in 3 different amperage ratings. Modulite Lite for up to 4 amps, Modulite for up to 6 amps, and Modulite HD for up to 20 amps. Modulites can be added to the vehicle after a standard 4-pole has already been installed with Modulite Adapters 118193, or 118189.
- **Trailer connectors get wet**, causing too many amps to be pulled through the converter. Water can unite all 4 wires on the trailer connector causing it to draw too many amps. This often happens when a boat trailer is backed into water with the trailer wiring still connected to the vehicle.
    - To **solve the problem** of connections getting wet, always disconnect the trailer connections before backing into the water. Also, covers can help prevent water from getting into trailer connectors when it rains or when a vehicle is taken through the car wash.
- **Bare wires touch each other or the trailer frame.** This causes too many amps to be pulled through the converter box. The coating on trailer wires can wear thin, often at the connection to the trailer's taillight or where the wires pass over the trailer suspension. If wires are hung too loose, they can get pinched and smashed between the trailer frame and suspension u-bolts.
    - To **solve the problem** inspect the trailer wires and replace any that are damaged or frayed.

If you purchased your wiring harness from etrailer.com and none of these fix your problem please feel free to contact us so our product experts, and installers can determine possible remedies or warranty coverage.

Trailer Wiring Connectors

Various connectors are available from four to seven pins that allow for the transfer of power for the lighting as well as auxiliary functions such as an electric trailer brake controller, backup lights, or a 12V power supply for a winch or interior trailer lights. Choose a connector that has the required number of pins for the functions required for your trailer. If the connector is under the vehicle, you will want to use a mounting bracket to attach it to the vehicle. This will help prevent damage that may occur if the connector is left dangling.

4-Way Connectors:

4-Way connectors are available allowing the basic hookup of the three lighting functions (running, turn, and brake lights) plus one pin is provided for a ground wire. Most standard light duty trailers will use a 4-pole flat connector.

4-Way Flat Trailer Connector

4-Way Flat Vehicle Connector

4-Way Round Trailer Connector

4-Way Round Vehicle Connector

5-Way Connectors

5-Way connectors are available allowing the basic hookup of the three lighting functions (running, turn, and brake) and besides the ground, one pin is available to provide support for another function. Typically the 5-Way Flat is used for trailers with surge brakes or hydraulic brakes. The additional wire is tapped into the backup lights to disengage the hydraulic trailer coupler (actuator) when the vehicle is reversing, thus turning off the trailer's brakes.

5-Way Flat Trailer Connector

5-Way Flat Vehicle Connector

5-Way Round Trailer Connector

5-Way Round Vehicle Connector

6-Way Connectors

6-Way connectors are available allowing the basic hookup of the three lighting functions (running, turn, and brake) the ground and two extra pins are available to provide two additional functions, typically for electric brakes and 12 volt "hot" lead. The 6-way round connectors are very common on horse trailers. The 6-way square connectors are more common on campers.

6-Way Trailer End

6-Way Vehicle End

6-Way Square Trailer and Vehicle Ends

7-Way Connectors

Aside from the three main lighting functions, additional pins for electric brakes, a 12 volt "hot" lead, and backup lights are available. There are two types of 7-way connectors. One has flat pins, which is often referred to as blades. The other has round pins. The round pin style is very rare. The RV style 7-way with flat pins (or blades) is very common. It is often found on newer trucks and suvs that come equipped from the factory with a trailer hitch.

7-Way Round Trailer Connector (Flat Pin)

7-Way Round Vehicle Connector (Flat Pin)

7-Way Round Trailer Connector (Round Pin)

7-Way Round Vehicle Connector (Round Pin)

Mounting Your Trailer Wiring Harness

Often the 4-pole trailer connector will remain in the trunk or cargo area of a car or SUV when not in use. This helps to extend the life of the connector by protecting it from the elements and accidental damage. When it is needed for towing, simply pull the connector out and shut the trunk or rear door. The rubber weather strip that provides a door seal keeps the wire from getting pinched. If the trailer connector needs to be mounted under the vehicle, we offer many different mounting brackets that will help to protect the connector and keep it from dangling beneath the vehicle.