



Trailer wiring woes can be fixed in a jiff using these simple techniques

# Troubleshooting Trailer Lights

Story and Photos  
by Rich Johnson

**T**railer lights live a hard life. Between the constant vibration of road travel and regular immersion in an environment that is alien to light bulbs and wiring, it's no wonder that trailer light problems are as common as they are frustrating. But faltering lights are more than a nuisance: They are downright dangerous. Those lights alert traffic that you are braking or changing lanes. In the dark, they also mark the left and right sides and rear extremity of the trailer. Important stuff, all.

In short, you can't afford to have problems with your trailer lights. Yet everyone does eventually.

Before trailering, always do a walkaround inspection to make sure the lights are working properly. Have a helper engage the headlights, turn signals and brakes while you observe. If you find problems, solve them before hitting the road. Failure to do so can lead to an expensive traffic ticket or an even more expensive accident.



## SIMPLE NEEDS

Trailer lights have fairly simple needs: There must be a source of power from the tow vehicle; an unbroken path for the electricity to follow (wires); an electrical ground to complete the circuit; and, of course, functional light bulbs (or LEDs). Along the way, there must also be an absence of corrosion.

If the trailer's lamps, lenses or wiring harness have been trashed by age or abuse — leaving

■ A multimeter (or, alternately, a test light) is your primary troubleshooting tool, allowing you to track down the root of the problem — whether it's a light fixture or a connector. Periodically coating connections with dielectric silicone can help stave off problem-causing corrosion.



broken lenses, corroded bulbs and sockets, and brittle wires or chafed insulation that cracks easily — it's time to consider replacing the entire system. Not a huge project, but not what we're talking about here. On these pages, we will cover

troubleshooting techniques for a system that's still worth saving.

Troubleshooting is nothing more than tracking down which culprit (blown fuse, broken wire, bad bulb or failed contact) is to blame. Necessary tools include a screwdriver, perhaps a

few wrenches (depending upon how your system is attached), and a multimeter or basic 12-volt light probe.

## SCENARIO 1

**Total loss of lights at the trailer:** This suggests power is not being delivered from the tow vehicle. Either the tow vehicle's light system has failed, or the connection between trailer and tow vehicle is suspect.

- Because the tow vehicle's light system powers the trailer lights, first check the truck itself. If the vehicle's lights don't work, look for a blown fuse in the fuse panel (either under the hood or below the dash). If the fuses are OK, the vehicle may have a light switch failure or wiring harness problem.

- If the tow vehicle's lights are OK, check for power in each port of the truck's "flat-four" or "round-seven" trailer plug by using a multimeter to probe each terminal while a helper switches lights on and off. If you're using a pigtail adapter between the truck and trailer (such as a "seven-round-to-flat-four" adapter), check each of its connection ports, as well.

By the way, on a boat trailer's typical flat-four-wire connector, the yellow wire is the left turn signal; the green wire is the right turn signal; the brown wire is the taillights; and the white is ground. When brakes are applied, power goes through both the yellow and green wires simultaneously. Flat-five-style connectors offer a fifth circuit (blue wire) that activates the reverse lock-out solenoid to allow backing up the trailer without activating the disc brakes.

- If the connector isn't delivering power, check for proper ground. A broken ground wire or paint, or corrosion between the pigtail ground wire and its connection point on the tow vehicle's frame may be to blame.

- If the connection point between the frame and ground wire is shiny and bright, but you still don't have power to the connector, either the connections with the tow vehicle's

wiring harness are bad, or the connector/adaptor itself is faulty. In this case, check all the connections on the tow vehicle's wiring harness (you may have to take it to a pro). You might also consider replacing the pigtail connector.

## SCENARIO 2

**Only some of the trailer lights are operating:** In this situation (and assuming you have already checked for power at the tow vehicle's plug and any pigtail adapter being used), you know you have power to at least some of the wires, so it comes down to isolating the trouble.

- Start by using a test light or multimeter to check any wire that leads to a failed light. This will allow you to determine if the wire itself is delivering power. If not, try tracing the problem back toward the plug.

- If the wire is delivering power, chances are the light fixture's individual ground is at fault. This is a common culprit. Disconnect and clean the connector and the area along the frame where it is attached, then reinstall the ground wire. If corrosion has invaded the hardware, you might need to install a new ring connector or a new bolt. It's important to realize that you can't get a good ground connection through paint or rust. Grind down to bare, shiny metal to make your ground connection.
- If that doesn't solve the problem, check the light bulb



■ Constant dunkings at the launch ramp are hard on light bulbs and related fittings. Poor contacts and corroded ground wires are common causes of trailer light trouble. Disconnecting your lights before launching will help prevent (or at least delay) this kind of grief.

for a blackened globe or broken filaments. If the bulb looks good, use steel wool to clean the lead contacts and brass casing. (Be sure to unplug the trailer lights before going any further.) Next, clean the fixture's contacts. Reinstall the bulb, reconnect the trailer wiring harness and see if the lights work. If you are dealing with sealed lights, however, you will have to purchase a new sealed bulb unit, because you can't remove and clean the old bulb. **Caution:** It is possible to insert bayonet-style bulbs with the lugs in the wrong slots. This will result in lights that are dim when they should be bright, and bright when they should be dim. If you have some kind of light during all functions (brakes, turn signals, headlights), you know that both filaments in the bulb are still good. So if the dim/bright operations are out of phase, you know the bulb has been reversed in its fixture.

- If your trailer is equipped with LED lights, there are no bulbs to inspect, clean and replace. If an LED light fails and

power delivery and ground are not the problem, the only choice is replacement. Otherwise, everything in the troubleshooting process is the same for incandescent or LED lights.

Now that you've got everything working, we'll share some final tips. Before dunking your trailer, disconnect the trailer harness from the tow vehicle; this will help ward off wiring woes by preventing electrical impulses from reaching the lights while they are submerged. And if you launch in salt water, after you pull off the ramp rinse everything with fresh water. This is not only important for trailer brakes, but for the lights and wiring, as well.

With some preventative maintenance and basic troubleshooting skills, you should be able to avoid most problems in the first place and fix any that do crop up. But, just to be safe, carry spare fuses, a heavy-duty flasher, taillight and a side marker light among your spare parts and tools. When it comes to trailer lights, it's the only way you can truly thwart Murphy. 🍀

COMMON WIRE COLORS & FUNCTIONS					
CONNECTOR TYPE	WIRE FUNCTION	WIRE COLOR	CONNECTOR TYPE	WIRE FUNCTION	WIRE COLOR
6-Way	Dual-Purpose Bulb System		7-Way	Dual-Purpose Bulb System	
	Light Turn & Brake Lights	Green		Light Turn & Brake Lights	Green
	Left Turn & Brake Lights	Yellow		Left Turn & Brake Lights	Red
	Taillights & Clearance Lights	Brown		Taillights & Clearance Lights	Green
	Ground	White		Auxiliary (Camber Plug)	Yellow
5-Way	Backup Lights	Red	Ground	White	
	Electric Trailer Brakes	Blue	Electric Trailer Brakes	Blue	
4-Way			Ground	White	
			Auxiliary Power/Battery Charge	Black	

**THERE ARE FOUR MAJOR TYPES** of vehicle-to-trailer electrical connectors for recreational towing, including four-, five-, six- and seven-way plugs. The chart above outlines the functions for each of the color-coded wires.

## TRAILER WIRING TIPS

At least twice a year, inspect your trailer's electrical system and take steps to eradicate corrosion by using a dielectric silicone on the connections. Check the wires' insulation for nicks that could lead to corrosion or shorts, and make sure the harness is secured to the frame rails, so wires don't hang down where they can snag. If the wires pass through any holes in the trailer frame, install grommets to prevent chafe.

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	Ground	White		Auxiliary (Center Pin)	Yellow
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