

# PHILLIPS

# Qwik Tech Tips

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## FEATURED PRODUCT

### PERMALITE XB™ LED

- Operating Voltage: 7V – 16V
- Draws 1.7A at 12V DC
- 1600 lumen output
- 18.25" x 5.75" x 1.10" (.75" recessed) design can fit just about any application
- Reverse polarity protection
- 175° light spread offers more lit area inside the trailer



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PAST ISSUES

## How to Determine Wire Size for Your Electrical Wiring Needs

When installing add-ons and/or additional accessories such as a liftgate, dome lamp or work lights, it is very important to select the correct wire gauge when adding new electrical wiring. If the wire gauge is too small, then there will not be enough power to operate the lights and/or existing trailer add-ons. There is also a risk of an electrical overload which can become a safety hazard because it can create a fire. On the same token, you don't want to overcompensate and choose a wire gauge that is too big, because although it reduces the possibilities of any safety hazards, it's not cost effective. However, by using a wire gauge selection chart you can better determine the correct wire size for your vehicle.

To use the chart, you will need to know the length of wire in feet for the circuit (or wire) you will be working on, as well as the maximum amps that are drawn on each individual circuit by all trailer lights and any add-ons (such as dome lamps). Although you may be working on one individual circuit you will need to know the maximum amperage draw of all circuits to determine if the ground wire is large enough to compensate for the return of any additional accessories you plan on adding.

Follow the steps below to determine which wire gauge is right for your add-on!

1. Choose the circuit you will be adding the additional wiring to for the operation of your new accessories/add-ons.
2. Measure the distance from the power source/battery to the most distant lamp/add-on on that circuit.



- Vehicles with more lights on them than usual, or that are pulling double trailers, will require a heavier gauge wire.
- It takes approximately the same amps to power one incandescent light as it does to power ten LED lights.
- The smaller the wire is in size, the larger the wire gauge number. The larger the wire is in size, the smaller the wire gauge number.
- When making a repair always use the same size wire gauge or bigger. NEVER use a wire gauge smaller than what is already being used.

(Note: This is NOT the length of the truck, but rather the length of the path that the electricity has to travel.)

3. Next, determine the total power drawn on the circuit by adding the maximum amperage drawn by all current lights and trailer add-ons, as well as the new additional accessories you wish to add.
4. On the chart below, match up the length with the total maximum amperage drawn to determine the wire gauge size needed for this install.

The amperage for the ground line is determined by the combined total maximum amperage drawn on the other circuits collectively. The wire gauge for the ground will be much larger to accommodate the amps being used by all other circuits.

Follow the steps below to determine if the ground will be able to compensate for the return of the additional add-on(s).

1. Combine the total maximum amperage drawn on all circuits together.
2. Measure the distance from the power source/battery to the back of the trailer to determine the approximate length of the ground wire.
3. Use the chart below to determine if the ground wire will be able to handle the total maximum amps drawn on all circuits simultaneously. If not, additional ground wiring will need to be added with the install of the new add on.

12-Volt System		WIRE GAUGE SELECTION CHART																					
		AMPS																					
Length of Cable from Battery to Most Distant Lamp	20ft	1	1.5	2	3	4	5	6	7	8	10	11	12	15	18	20	22	24	36	50	100	150	200
	30ft	20	20	20	20	18	18	18	16	16	16	16	14	14	12	12	12	10	10	8	8	4	2
40ft	20	20	20	18	16	16	16	14	14	12	12	12	12	10	10	10	10	8	8	6	4	2	1
50ft	20	20	18	18	16	14	14	14	12	12	12	12	10	10	10	8	8	8	6	2	1	1/0	1
60ft	20	20	18	16	16	14	14	12	12	12	10	10	10	8	8	8	6	4	2	1/0	2/0	2/0	2/0
80ft	20	18	16	16	14	12	12	12	10	10	10	10	8	8	8	6	6	4	1	2/0	3/0	3/0	3/0
100ft	18	18	16	14	12	12	12	10	10	10	8	8	8	6	6	6	4	2	1/0	3/0	4/0	4/0	4/0

Have technical questions? Get the latest tips from a skilled Phillips engineer!

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