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# Nextelligence® Newsletter

Issue #17

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## Welcome to the Nextelligence Newsletter!

Welcome to the 17th edition of the Nextelligence Newsletter. We look forward to continuing to provide the latest news in the Nextelligence training community.

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**TIDMORE'S**  
Nextelligence Tech Tips  
From Master Trainer Donald Tidmore

## Size Matters

Why using the correct size fuse is important!



In this month's edition of the Nextelligence Newsletter, we are going to discuss why, as technicians, we must replace fuses with their proper rating rather than just using what we think the circuit should have or using what we have in our toolbox to get us out of a pinch and get the equipment back online.

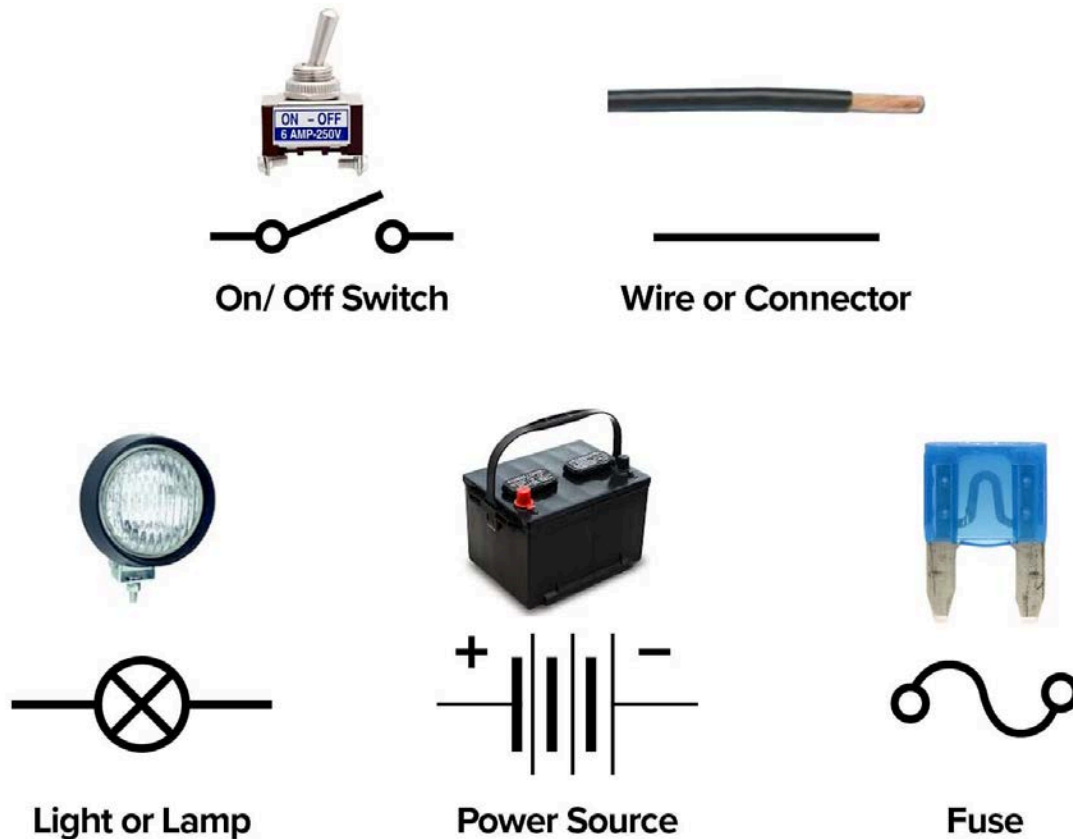
A fuse is placed in a circuit as a protection device in case of a high amp load or overcurrent condition. When too much current is present in the system, the fuse will open or "blow" to protect the wire and the component, preventing a thermal event from occurring.



Multiple calculations occur when the circuit is designed. We must first know how many amps the device in the circuit "draws" or uses. If you look at the information tag on an electrical device, it will tell you that this unit consumes an "X" number of amps at an "X" number of volts. From here, the proper sized wire is chosen from the American Wire Gauge, or as we call it, AWG. AWG and gauge are sometimes used interchangeably when speaking electrically. From here, we select the proper wire size from the AWG chart and start building our circuit. Let's create a circuit to explain why fuse sizing is important.

## Electrical Schematic Circuit Symbols

We will use some basic electrical schematic symbols in conjunction with their pictorial images to construct a basic electrical circuit, such as a lighting circuit. We need a switch, wire, a light, a power source, and a fuse to protect the circuit.

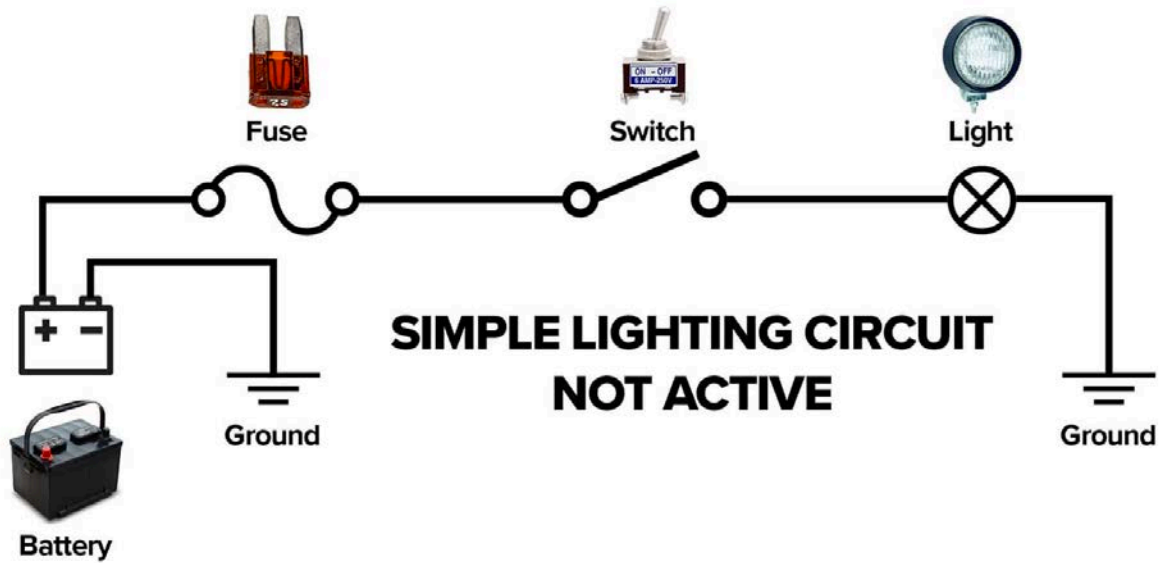


Now that we have the components identified, let's create the circuit and discuss what happens when an improper fuse size is selected.

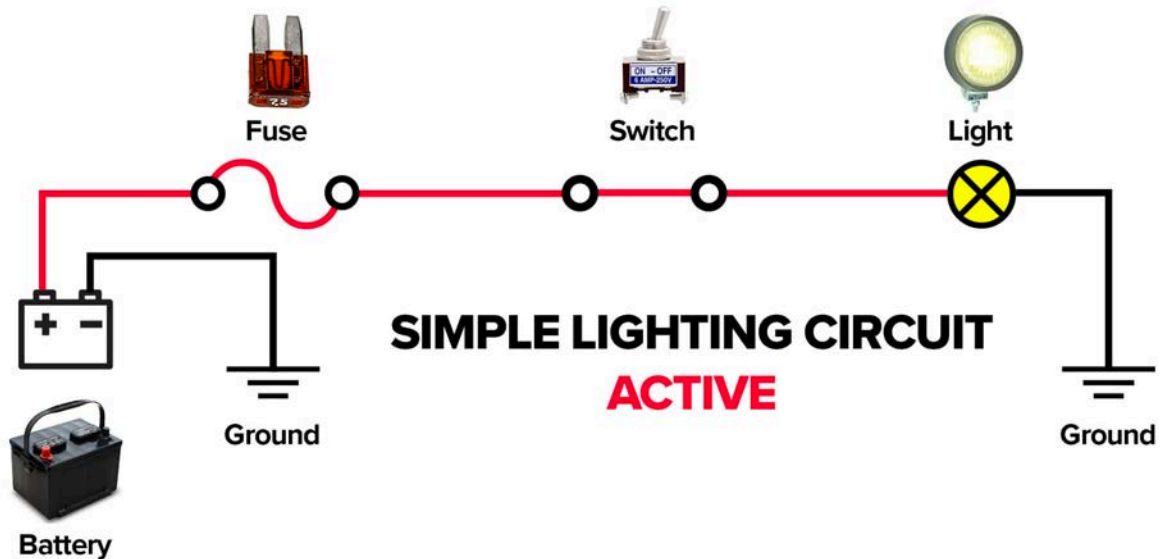
## Creating A Circuit

Fuses, switches, and wires are all sized based on the amperage they can safely conduct in a circuit. Typically, the fuse size is 1.25% of the overall rating for the circuit. For ease of calculation, we will say that we have a light that consumes 5 amps, a wire that can conduct the amount of current we are using, and a switch that is rated for 6 amps with the closest size in ampacity rating for a fuse, which in this case is 7.5 amps. We will not cover wire gauge and fuse colors in this newsletter, but in the automotive world, fuses are rated by ampacity and color. An example would be red equals 10 amps, and blue would

equal 15 amps. Unless someone has replaced a fuse with the wrong amp rating, the equipment should have the proper ampacity and color of fuse from the factory.



Above we can see a simple lighting circuit that is not active. Let's close the switch or turn it on and talk about the importance of the fuse in this circuit.



In this schematic, we have turned the switch on, and the light is illuminated. This is a suitable working circuit.

So, what happens if we replace the fuse with a 3-amp fuse? We know the light consumes 5 amps, so immediately, the fuse would open to protect the circuit.

**What if we only had a 15-amp fuse to repair the circuit, and we installed that fuse into the circuit?** By doing this, we have exceeded the safe operating current limits of the switch, the wire, and the light. If we were to have a voltage increase or, more commonly, a short circuit, such as a wire that is missing insulation and that wire comes in contact with the frame that is connected to the ground source, the resistance in the circuit goes to near zero resistance.

**What happens when the resistance decreases?** You have a positive source going straight to the ground. At this point, the current increase is to its maximum capacity. If we have a fuse rated higher than our components and wire, the fuse now does not offer any protection. Now, the lowest current-rated component in the circuit becomes the failure point. It could be the wire, the switch, or the light. We now have a potential for a thermal event and significant damage to the equipment.

**This is why it is always important as technicians that when we change fuses in a circuit, we use the proper fuse in the electrical circuits that we diagnose and repair as technicians.**

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Would you like to know more about Electrical Systems and related topics? Good news! We teach that in our Nextelligence MAT classes. You can get in-depth training by contacting us to register for a Nextelligence MAT class at: [Nextelligence@doveresg.com](mailto:Nextelligence@doveresg.com)

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## The 2024 Nextelligence Training Schedule Is Here!

The 2024 Training Schedule is now available and can be viewed via the Nextelligence webpage, or on the Heil Dealer Portal.

### 2024 Live Online Webinar Heil Training Schedule

Online Training Dates	Product	Time
April 2nd, 3rd, & 4th	HalfPack w/Odyssey Controls	9:00 - 11:30am CST
May 21st, 22nd, & 23rd	DuraPack Rapid Rail	2:00 - 4:30pm CST
June 4th & 5th	Rapid Rail	9:00 - 11:30am CST

### 2024 Heil Factory Training Schedule

Factory Training Dates*	Product	Time
April 16th & 17th	HalfPack w/Odyssey Controls	8am – 4pm CST
June 18th & 19th	RevAMP	8am – 4pm CST

\* Subject to change

\*\* 3rd Eye training can be scheduled as a REQUESTED third half day upon request.

[VIEW FULL 2024 TRAINING SCHEDULE](#)

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## Nextelligence Class Registration

Feel free to contact us anytime if you have any training questions or to register for one of our training classes.

EMAIL TRAINING

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