

Keeping it Safe: Stage Lighting Safety Overview

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This informational session presents an overview of best practices for safe operation of equipment in a theatrical setting.

It should not be viewed as comprehensive safety training. Participants are encouraged to participate in additional training and certifications as appropriate to their work and work environments.

Introduction

Theatres can be inherently hazardous work environments. During Load In and Strike the Stage is, essentially, a construction site. A “Safety First” Culture with good habits is the best way to avoid accidents and injury.

- Understand and review the hazards of the work environment every day.
- Ensure that work is performed carefully and deliberately.
- Equipment and tool operators should always be properly trained.
- Always wear proper PPE (Personal Protective Equipment)



Educational Theatre has special hazards

The biggest difference between a construction site and a theatre is that on a construction site you must be 18 or older to operate...

- Power tools
- Personnel Lifts
- Hoisting or Rigging equipment

...and Construction sites require safety meetings before the start of work every day.



Main Causes of Accidents

Most accidents are avoidable. The main causes of accidents are preventable with proper care and planning...

- Not understanding the hazards of the environment in relation to the work.
- Lack of awareness of structures or personnel surrounding the work.
- Improper use of tools or equipment
- Not wearing PPE
- Taking unnecessary risks or being in a hurry



It's either safe or it isn't.

Maintaining a culture of safety is the best way to ensure that no one gets hurt backstage.

A culture of safety starts with an understanding that “safe” is not a sliding scale – something is either safe or it isn't.

The injury caused by a fall, shock, impact, or puncture is not reduced when it happens in a theatre or shop rather than a construction site.

“Safe Enough” is neither.



Stage Lighting and Electric Safety

Understanding your Equipment

Before beginning installation, ensure that you are familiar with the specific stage light models you are using.

Each lighting fixture, such as moving heads, PAR lights, and LED stage lights, has unique installation requirements.

Refer to the manufacturer's manual for details on weight, power requirements, and recommended mounting techniques.



Electrical Safety

Electrical safety is crucial when installing stage lighting. Follow these guidelines to avoid electrical hazards:

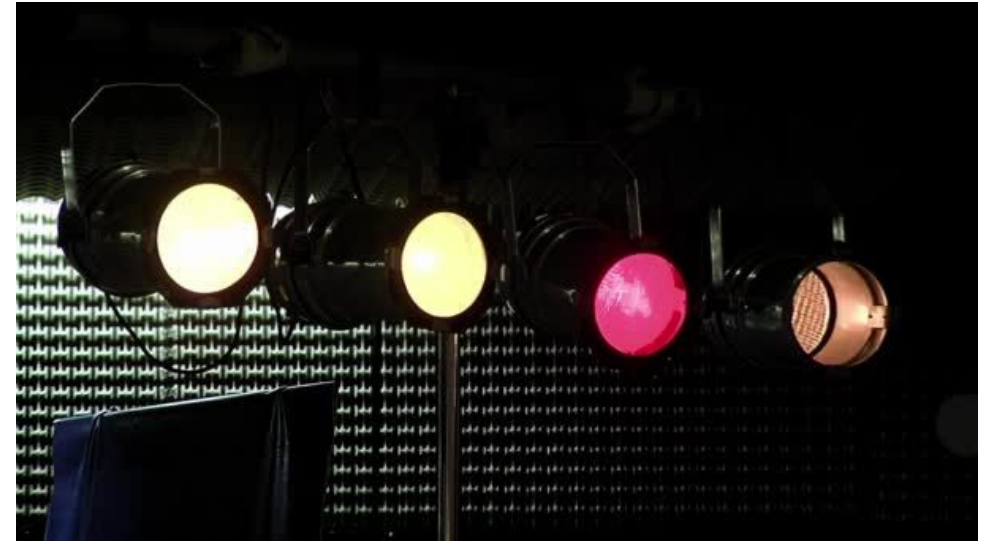
- Always turn off power before beginning the installation of any lights or related equipment.
- Ensure all wiring is correctly grounded and insulated to prevent short circuits or electric shocks.
- Use circuit breakers and surge protectors to protect both the lights and the crew from electrical issues.
- Maintain at least 3' clear in front of every electrical panel, dimmer panel, and relay panel per NEC.



Mounting and Rigging Fixtures

Stage lighting typically requires mounting high above the stage, often on trusses or overhead grids. For safety reasons, it's important to:

- Use secure mounting hardware rated for the weight of the lights.
- Ensure all rigging points are properly aligned and locked to prevent accidental falls.
- Never overload the truss or rigging system with more weight than it's rated to handle.
- Perform regular inspections of the mounting systems to check for wear and tear.



Cabling

Cabling and wiring are an essential part of the stage lighting setup, but they also pose safety risks. To minimize hazards:

- Secure cables along the floor or walls to prevent tripping or accidental unplugging.
- Use cable covers or clips to ensure cables are protected from damage and clearly marked.
- Always test all cables and connections before final installation to ensure they are working properly.
- Neatly dress cables along battens.



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Ventilation

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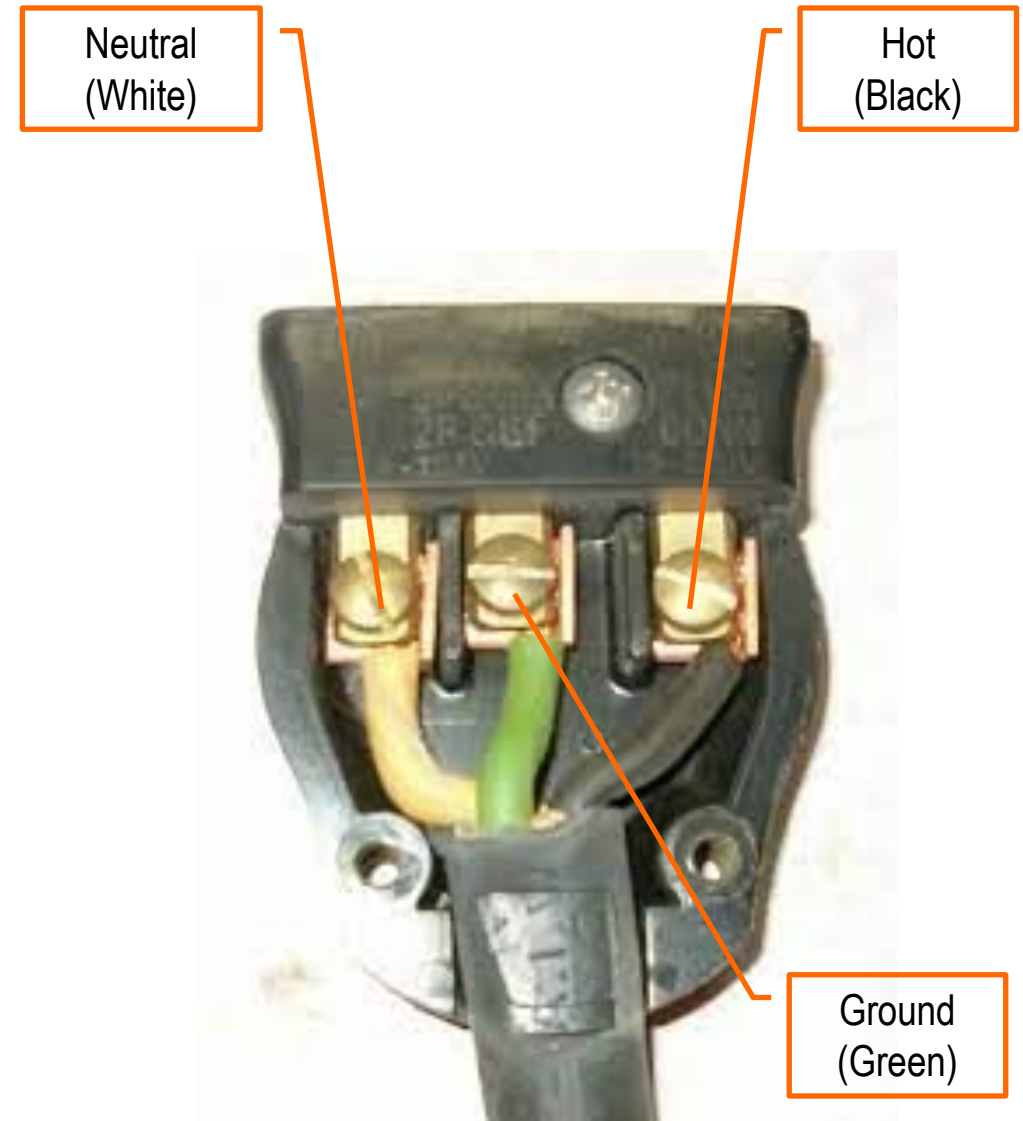
Equipment

Correct wiring – Stage Pin

All cables and connectors should be tested regularly to make sure they are correctly wired and in good condition.

If students install connectors or perform wiring they should be closely supervised by an adult that understands electrical work.

Cables with intermittent connection issues likely have a loose wire and should be removed from service until repairs can be performed.

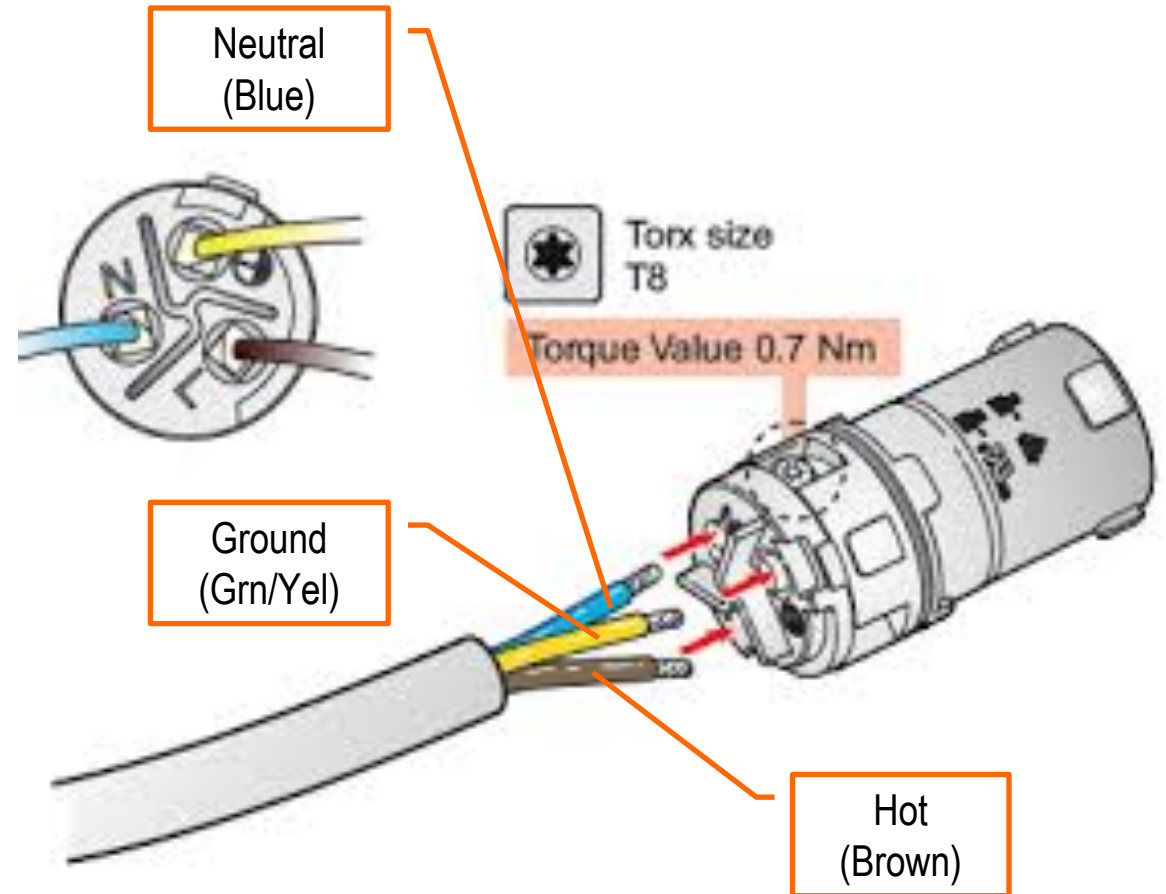


Correct wiring – PowerCon/ True1

PowerCon and PowerCon connectors the standard connector for most modern LED and automated lighting fixtures.

The wiring in these cables and cords tends to come in different (European) Colors than the Blk/Wht/ Grn arrangement common to most US manufacturing.

Just when you thought you had it all figured out.....



Strain Relief

All cables and power cords for stage lighting fixtures should be equipped with appropriate strain relief.

Fixtures and cables without appropriate strain relief present an electrocution hazard and should be removed from service immediately.



Bare Wires

All cables and power cords for stage lighting fixtures should have a full Cable Jacket in good condition.

Electrical tape is not suitable.

Fixtures and cables without an appropriate jacket present an electrocution hazard and should be removed from service immediately



Safety Cables

Always attach a safety cable directly between the fixture and the batten or suspension point. Never rely on just a clamp or bolt.

Accessories such as barndoors, color frames, snoots, and effects in the color frame holder should be secured with a locking clip on the color frame or a safety cable.

The safety cable should go on before the fixture is locked down, and come off after it is loosened.

Safety Cable for
Moving Head Light



Unplug when changing the lamp!

When changing the lamp in a tungsten-halogen fixture, always unplug the fixture before opening it up to change the lamp.

Re-insert the lamp housing (“cap”) into the fixture before plugging the fixture back in to test.



Do not Hot Plug!

Stage pin connectors are not rated for connection/ disconnection while under load.

Circuits should be OFF via controls or circuit breaker when plugging/ unplugging loads from circuit distribution.



Wear Gloves

Tungsten-halogen lighting fixtures get very, very hot and can cause severe burns.

Always wear insulated, heat-resistant gloves when focusing or troubleshooting/ relamping tungsten fixtures.

Remember that Gobos (patterns) in tungsten fixtures are usually glowing red-hot when removed from a fixture that is on.



Dimmers

If something is wrong with your Dimmer rack or modules and you cannot identify the issue, please call a trained technician or service center.

Dimmer racks are useful but dangerous if you aren't aware of all the hazards involved.

Never reach beyond the face of any dimmer rack, Panel, or Switch unless you are trained for their maintenance.



Electrical Access

Keep access to power maintenance and disconnects clear incase on an emergency, They are only useful if you can get to them easily

Make sure people using you space are aware of the location and function of the power disconnects before they begin working.



Be safe on lifts and ladders

When hanging and focusing lights, safely use lifts and ladders in accordance with manufacturers recommendations and best practices.

- Do not lean sideways on a ladder past the belt buckle.
- Do not stand in the top step of a ladder.
- Stay within the guardrails of the lift. Do NOT climb out of the basket.



Questions?

