

Do-It-Yourself Garage

Marine Electrical Connections - Jeff Cote



Pacific  Yacht Systems
marine electronics & electrical

design • installation • service • support

Safety



- Safety is paramount
- Land vs marine electrical code
- Trouble/fire on land vs at sea

Assembly Problems



High Standards



- For electrical systems
 - No room for error
- Weak points in electrical systems:
 - Equipment failure
 - Wire dead short
 - Bad connection
 - Cleanliness
 - Bad crimp

Corrosion

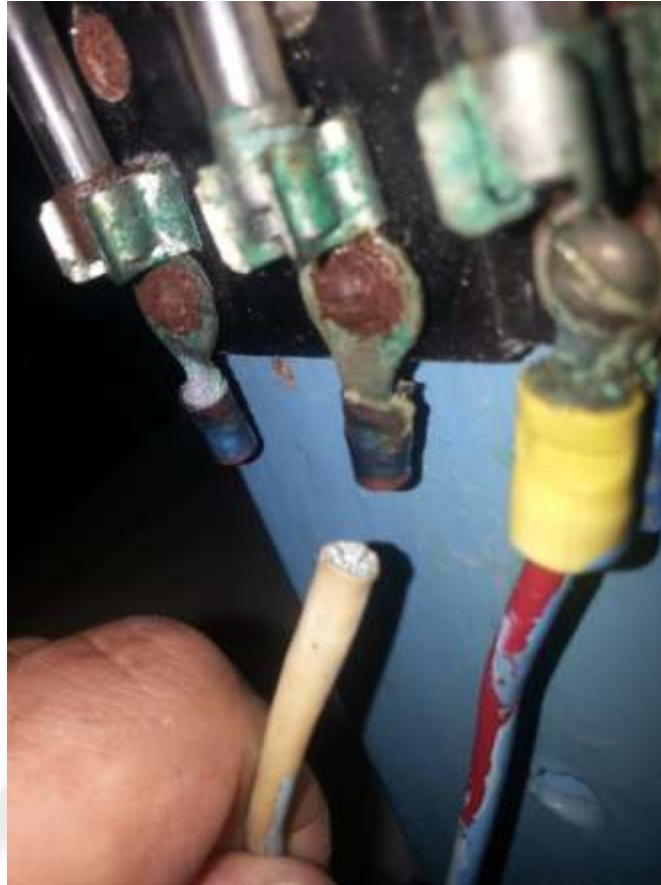


Consequences



- Bad connection or bad crimp:
 - Under load and over time causes heat
 - Enough heat can cause fire
- Gotcha: breaker or fuse might NOT trip

More Corrosion



Formula for Success



- Marine wire
- Proper Terminals
- Adhesive Lined Tubing
- Tools
- Technique

Improper Connection



Marine Grade Wiring



- Marine Wire Advantages:
 - Standardization of colors
 - Able to withstand vibration
 - Flexible for ease of installation
 - Coated to resist heat, abrasion, salt water, battery acid, UV rays, gasoline
 - Better suited for inhibiting corrosion



Improper Connection

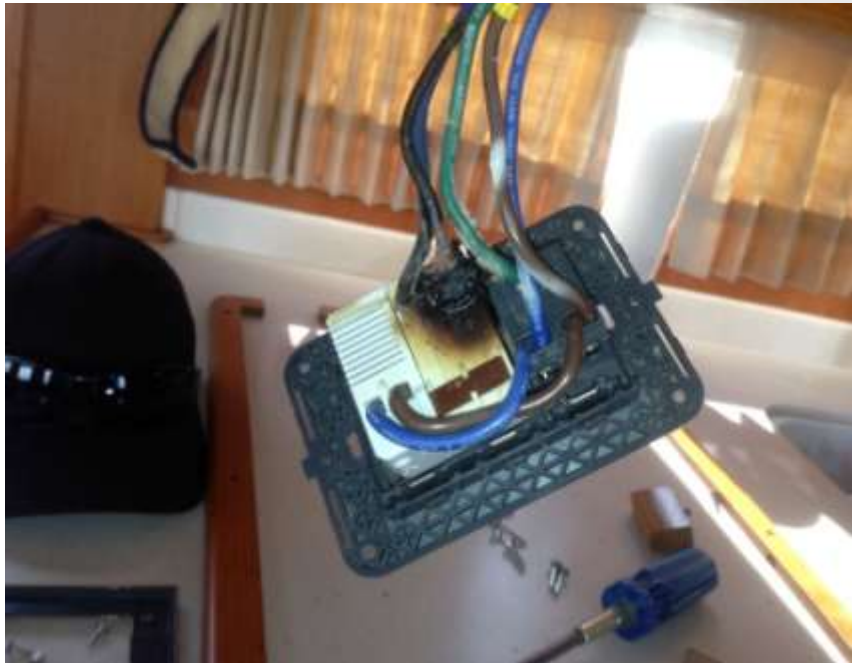


Terminal Choice



- What is the right terminal for the job:
 - Ring, spade, butt, disconnects
 - Size
- Heat shrink Terminals:
 - Waterproof and seal electrical connections when crimped and heated
- Nylon Terminals:
 - Easy to crimp and does not split

Loose Connection

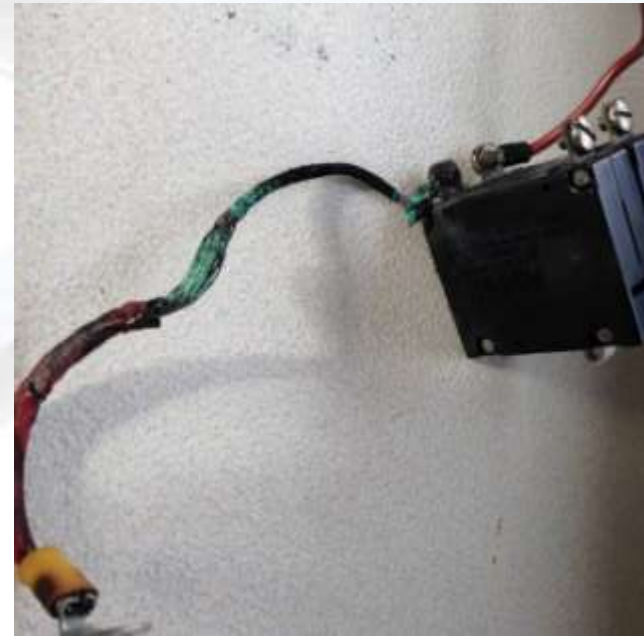


Adhesive Lined Tubing



- Helps protect wire from corrosion
- Choose the right size for the terminal
- Better to follow ABYC color codes
- Use heat to properly shrink insulation
- What is the shrink ratio?
- Bonus: Provides strain relief

Bad Crimp



Tools: Wire Stripper



Tools: Crimper



Double Crimp Ratchet Tool

Single Crimp Ratchet Tool

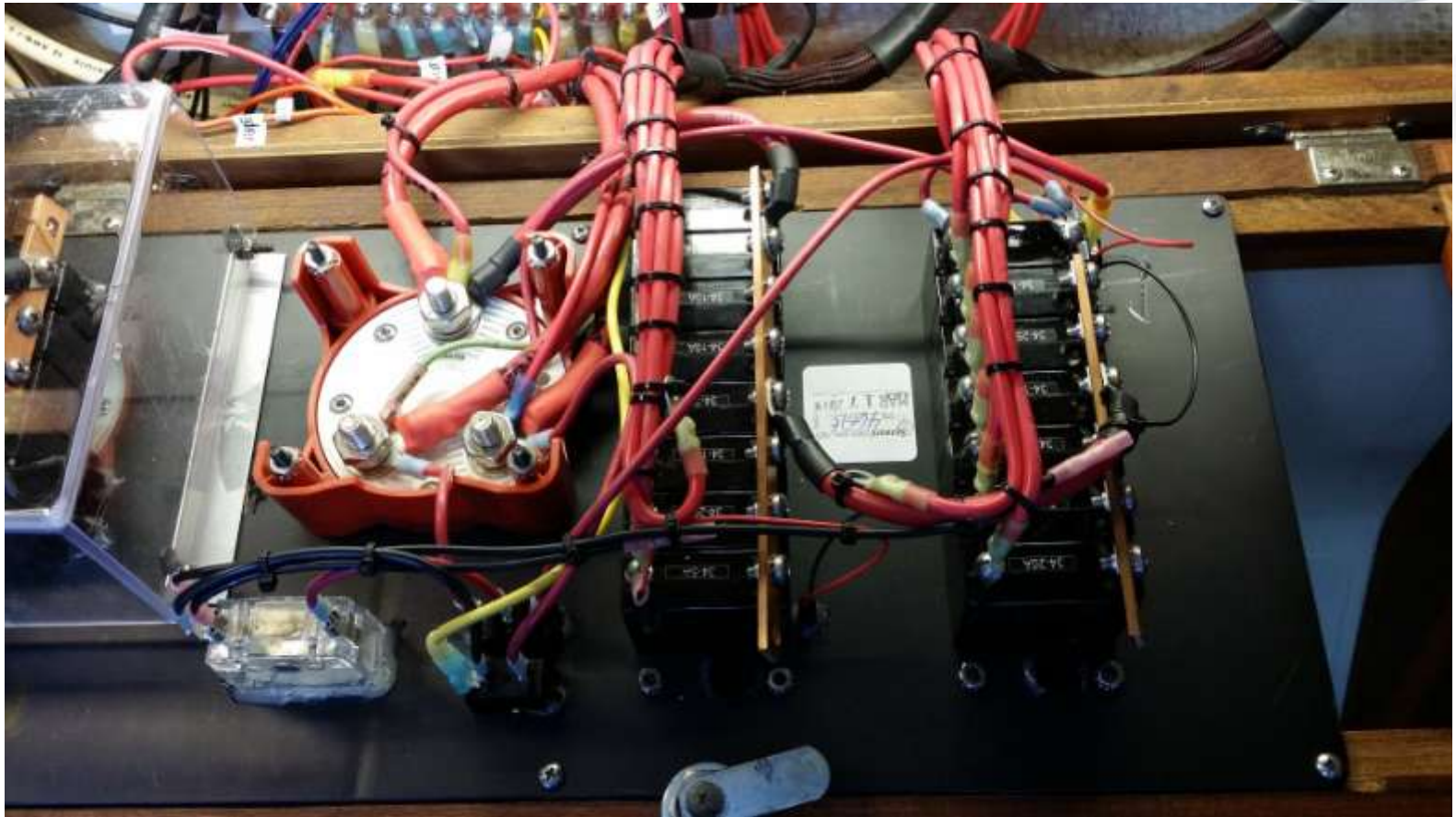


Technique



- Choose nylon or heat-shrink
- Remove the right amount of jacket insulation
 - Not too much nor too little
- Insert wire without any loose strands
- Choose the right tool for the terminal
- Crimp the right amount
- Pull test
- Optional: Apply heat to shrink down insulation

Good Workmanship



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