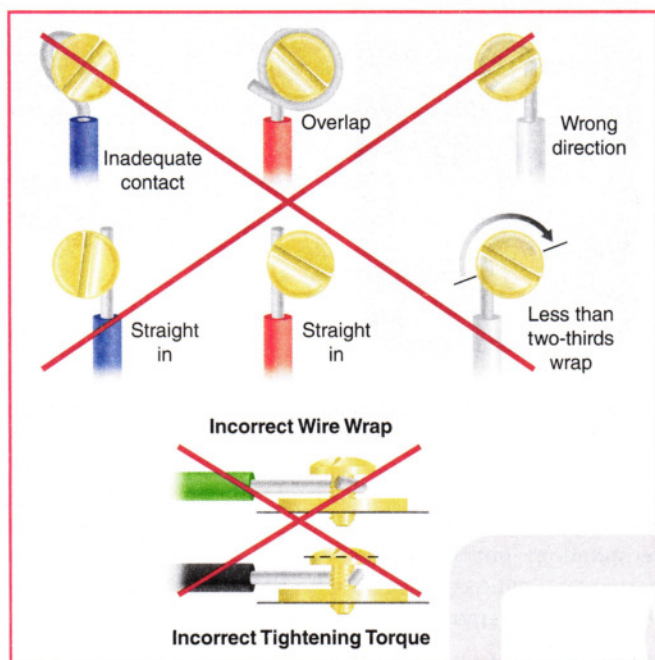


Exhibit 110.3 illustrates incorrect methods of connection. These methods should *not* be used.



**EXHIBIT 110.3** Incorrect methods of terminating aluminum wire at wire-binding screw terminals of receptacles and snap switches.

#### Existing Inventory

Marked 12 AWG or 10 AWG solid aluminum wire that does not bear the new aluminum wire label should be used with wiring devices marked "CO/ALR" and connected as described under the heading Installation Method. This is the preferred and recommended method for using such wire.

For the following types of devices, the terminals should not be directly connected to aluminum conductors but may be used with copper or copper-clad conductors:

1. Receptacles and snap switches marked "AL-CU"
2. Receptacles and snap switches having no conductor material marking

Receptacles and snap switches that have back-wired terminals or screwless terminals of the push-in type are for 14 AWG copper conductors only.

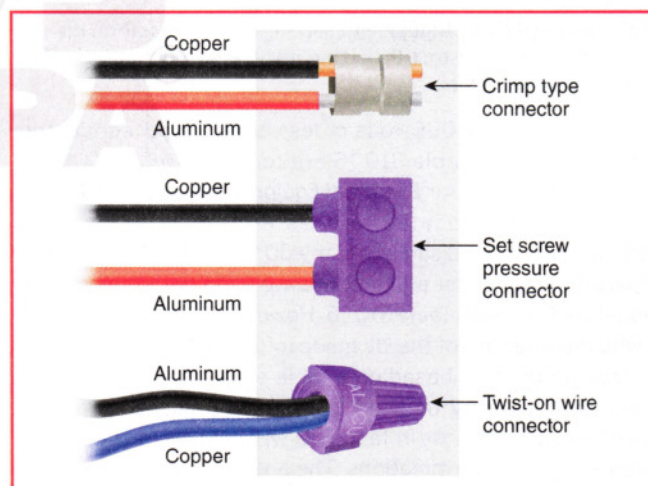
#### For Existing Installations

If examination discloses overheating or loose connections, the recommendations described under the heading Existing Inventory should be followed.

#### Splicing Wire Connectors

Splicing wire connectors are required to be marked for the material of the conductor and for their suitability where intermixed. Splicing wire connectors, such as twist-on wire connectors, are not suitable for splicing aluminum conductors or copper-clad aluminum to copper conductors, unless it is so stated and marked as such on the unit container or an information sheet supplied with the unit container. The required marking is "AL-CU (intermixed-dry locations)" where intermixing (direct contact) occurs. Other types of listed splicing wire connectors that are not rated for intermixing between the copper and the aluminum may also be used, as long as the conductors are not in direct physical contact. These connectors are just marked "AL-CU."

UL lists twist-on wire connectors that are suitable for use with aluminum-to-copper conductors, in accordance with UL 486C, *Splicing Wire Connectors*. The UL listing does *not* cover aluminum-to-aluminum combinations. However, more than one aluminum or copper conductor is allowed where used in combination. Suitable wire combinations are marked on the unit container or supplied on the information sheet with the unit container. These listed splicing wire-connecting devices are available for pigtail short lengths of copper conductors directly to the original aluminum branch-circuit conductors as shown in Exhibit 110.4. Also depicted is a similarly rated crimp splicing device that is also suitable for intermixing (direct contact). Primarily, these pigtailed conductors supply 15- and 20-ampere wiring devices. Pigtailling is permitted, provided suitable space exists within the enclosure.



**EXHIBIT 110.4** Pigtail copper-to-aluminum conductors using two listed devices.

**(C) Temperature Limitations.** The temperature rating associated with the ampacity of a conductor shall be selected and coordinated so as not to exceed the lowest temperature rating of any connected termination, conductor, or device. Conductors with temperature ratings higher than specified for terminations shall be permitted to be used for ampacity adjustment, correction, or both.

**(1) Equipment Provisions.** The determination of termination provisions of equipment shall be based on 110.14(C)(1)(a) or (C)(1)(b). Unless the equipment is listed and marked otherwise, conductor ampacities used in determining equipment termination provisions shall be based on Table 310.16 as appropriately modified by 310.12.