

STANDARDS FOR ELECTRICAL JUMPER CONNECTORS FOR TRAILERS

1. SCOPE:

1.1 This Standard describes construction of uniform electrical jumper connection "kits" to mate trailer-mounted electrical connections on mobile rescue caches to a variety of towing vehicles.

1.2 This Standard requires Group-owned or affiliated mobile rescue caches to have jumper connection kits maintained with each cache to permit electrical connections to additional towing vehicles for transport of the equipment to rescue and training sites.

1.3 Rescue technicians are encouraged to apply this Standard to personally owned towing vehicles and trailers to promote the greatest availability and mobility of rescue equipment.

2. REFERENCED DOCUMENTS:

2.1 "Standards for Interchangeable Rescue Equipment," Triangle Rescue Group, 07-02-90.

2.2 "Recommended Wire Gauges and ATA Recommended Circuit Color Coding," Belden Automotive Wire and Cable Company.

2.3 "Automotive Electrical Connector Catalogue," Belden Automotive Wire and Cable Company.

3. DEFINITIONS:

3.1 Trailer Socket: Vehicle-mounted electrical fitting with either recessed male contacts covered by a weather resistant flap, or enclosed female contacts. The Standard trailer socket for use by Triangle Rescue Group is:

3.1.1 NAPA Echlin #TC 6206 6-pin socket.

3.2 Alternative, non-Standard common trailer sockets for use with jumper connectors:

3.2.1 NAPA Belden #720228 square female trailer connector, 4-pin

3.2.2 NAPA Belden #720225 female (flat) trailer connector with 18" leads, 4-pin.

3.3 Trailer Plug: Either trailer-mounted 6-pin electrical plug with female contacts for insertion into recessed and covered sockets, or bare male connectors. Approved trailer plugs:

3.3.1 NAPA Echlin #6207 6-pin plug

3.3.2 NAPA Echlin #6208 6-pin plug, with strain relief spring

3.4 Alternative, non-Standard common trailer plugs, for use with jumper connectors:

3.4.1 NAPA Belden #720227 square male trailer connector, 4-pin

3.4.2 NAPA Belden #720224 4-contact, 16 ga. (flat) male plug

3.5 Crimp-on Wire Connectors: "bullet"-type male and female insulated crimp-on wire connectors for use in construction of jumper assemblies to mate rescue trailer electrical connections to alternative trailer and vehicle plugs and sockets. Approved wire connectors:

3.5.1 NAPA Belden #720547 0.157 inch diameter snap plug receptacle, 18-14 gauge, insulated connector, (female).

3.5.2 NAPA Belden #720148 0.157 inch diameter snap terminal connector, 16-14 gauge, (male).

3.5.3 NAPA Belden #720525 two wire connector. (Used to change the gender of the male #720148 Belden "bullet" snap terminal connector to a female fitting).

4. DISCUSSION:

4.1 Triangle Rescue Group has Standardized trailer plugs and sockets for its mobile rescue caches and dedicated rescue vehicles. At times, it is necessary to tow a rescue trailer with a vehicle that is not fitted with a Standard trailer plug. Jumper connectors are required to mate the trailer and non-Standard vehicle connections.

4.2 Mixture of Standard trailer plugs and sockets and alternative types of trailer connectors requires "jumper kits" to make connections between Standardized trailers and other vehicles. The use of industry standard trailer plugs and sockets and industry standard electrical connectors to build connector kits will allow wires to be interchanged and permit lighting and other circuits to be completed between rescue cache trailers and most common alternative trailer connectors found on other towing vehicles.

5 STANDARD TRAILER ELECTRICAL CONNECTIONS:

5.1 Electrical trailer connections for the mobile rescue caches are standardized by use of the NAPA Echlin 6-pin #TC-6206 trailer socket mounted on the towing vehicle, and the NAPA Echlin 6-pin #TC-6207 or #TC-6208 trailer plug on the rescue cache trailers.

5.2 A jumper connector kit will be made for each rescue cache trailer, containing one of the NAPA Echlin trailer plugs and one of the NAPA Echlin #TC-6206 trailer sockets, each fitted with a 12" to 18" six-wire pigtail.

5.3 Wires used for these pigtails will be #14 AWG automotive-type stranded copper single conductor wire.

5.4 Standardized wire color coding will be used for clarity, as recommended by the Belden Automotive Wire and Cable Company:

5.4.1 White: ground return to towing vehicle.

5.4.2 Black: ICC required marker and clearance lamps.

5.4.3 Yellow: left turn directional lamp.

5.4.4 Red: stop lamps.

5.4.5 Green: right turn directional lamp.

5.4.6 Blue: auxiliary circuit, (electrical brake lead, if used).

5.5 All trailer plugs and sockets mounted on the mobile rescue cache equipment will be tagged to show pinout connections and color codes for lights and other uses.

5.6 All jumper kit trailer plugs and sockets will have their pigtails tagged to indicate pinout connections and/or color codes for clarity in making up alternative vehicle electrical connections.

5.7 Electrical connections within Standard trailer plugs and sockets on Group equipment and within the jumper plugs and sockets will be made up as marked on the NAPA Echlin trailer plugs and sockets:

5.7.1 Center contact: (Blue) Electric brake contact, when used.

5.7.2 pin GD: (White) ground lead.

5.7.3 pin LT: (Yellow) left turn/ brake lamp.

5.7.4 pin RT: (Green) right turn/ brake lamp.

5.7.5 pin TM: (Red) clearance/ tail lamp.

5.7.6 pin A/S: (Black) backup lamps, when used

6. JUMPER CONNECTION KIT CONSTRUCTION

6.1 Each wire from the NAPA Echlin 6-pin trailer plug jumper pigtail will be terminated in the NAPA Belden #720547 0.157 inch snap plug receptacle, insulated female connector.

6.2 Each wire from the NAPA Echlin 6-pin trailer socket jumper pigtail will be terminated in the NAPA Belden #720148 0.157 inch snap terminal connector, male fitting.

6.3 Pigtail jumpers will be made up for the NAPA Belden #720228 square female trailer connector and the NAPA Belden #720227 square male trailer connector, using the male NAPA Belden #720148 snap terminal connectors on all leads.

6.4 Pigtail jumpers will be made up for the NAPA Belden #720225 female (flat; 4-pin) trailer connector and the NAPA Belden #720224 4 contact 16 gauge (flat) male plug, using the male NAPA Belden #720148 snap terminal connectors on each of the leads.

6.5 A short 6-lead pigtail harness will be made up in the standard wire colors for the electrical connections. (See related standard 5.4). One end of this 24" wire harness will be left bare, and one end will be fitted with the male NAPA Belden #720148 snap terminal connectors. (This harness will permit connections to be spliced into the wiring harness of the vehicle or the trailer if no other means of connection is available).

6.6 Extra connectors will be placed with the kits, including six #14 AWG saddle tap connectors, six wire nuts for #14 AWG wire, and a package of #720525 NAPA Belden two-wire connectors to permit gender-changing of the male "bullet" snap terminal connectors. (Electrical tape and plastic cable ties complete the kit).

7. USE OF THE JUMPER CONNECTION KIT

7.1 Connections from the vehicles will be recessed or female connections devices. The NAPA Echlin 6-pin trailer plug jumper for Standardized vehicles will terminate in the female NAPA Belden snap plug receptacles, for use with trailers that are not Standardized. (See related standards 6.3 and 6.4).

7.2 Connections from the trailer will be male connection devices. The NAPA Echlin 6-pin jumper trailer socket will connect to the Standard trailer plugs, and the pigtail will terminate in male NAPA Belden snap terminal connectors.

7.3 Most vehicle-mounted alternative female trailer connections, such as the NAPA Belden #720225 (flat) female trailer connector, will accept the 0.157 inch NAPA Belden snap terminal connectors. These plug directly into the terminals in the flat connector. (The bare ground terminal on the four-wire flat trailer connector will accept a NAPA Belden #720525 two wire connector. This will take the fourth male snap terminal connector from the pigtail).

7.4 Additional connectors, such as the square four prong trailer connectors, will make the jumper connection kit sufficiently versatile to mate Standardized 6-pin trailers to most alternative towing vehicles wired with the most common 4-pin trailer sockets.

7.5 When alternative sockets will not match at all, the 6-wire jumper harness and wire nuts or saddle taps will allow splicing of wires to get essential highway lighting operating on the trailer.

7.6 Use of NAPA Belden snap plug receptacles and male snap terminal connectors will allow wires to be plugged into different configurations and make up trailer electrical connections that will match those on the towing vehicle.

7.7 Use of 4-pin trailer connections on alternative towing vehicles supposes that circuits for clearance lights or electric brakes may not be connected as they are when Standardized trailers are used with their assigned towing vehicles. Caution must be exercised when alternative vehicles are chosen for use.